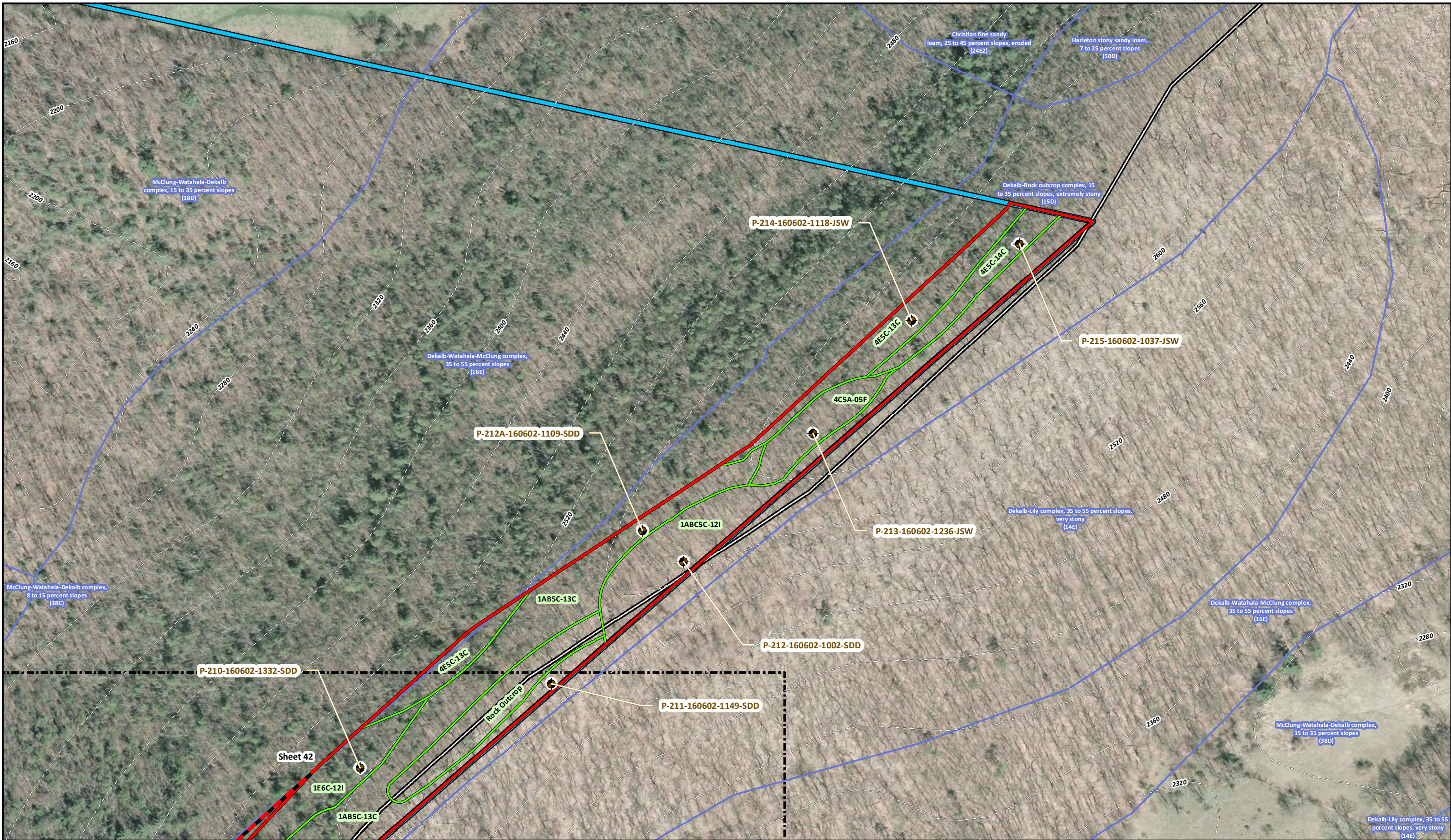
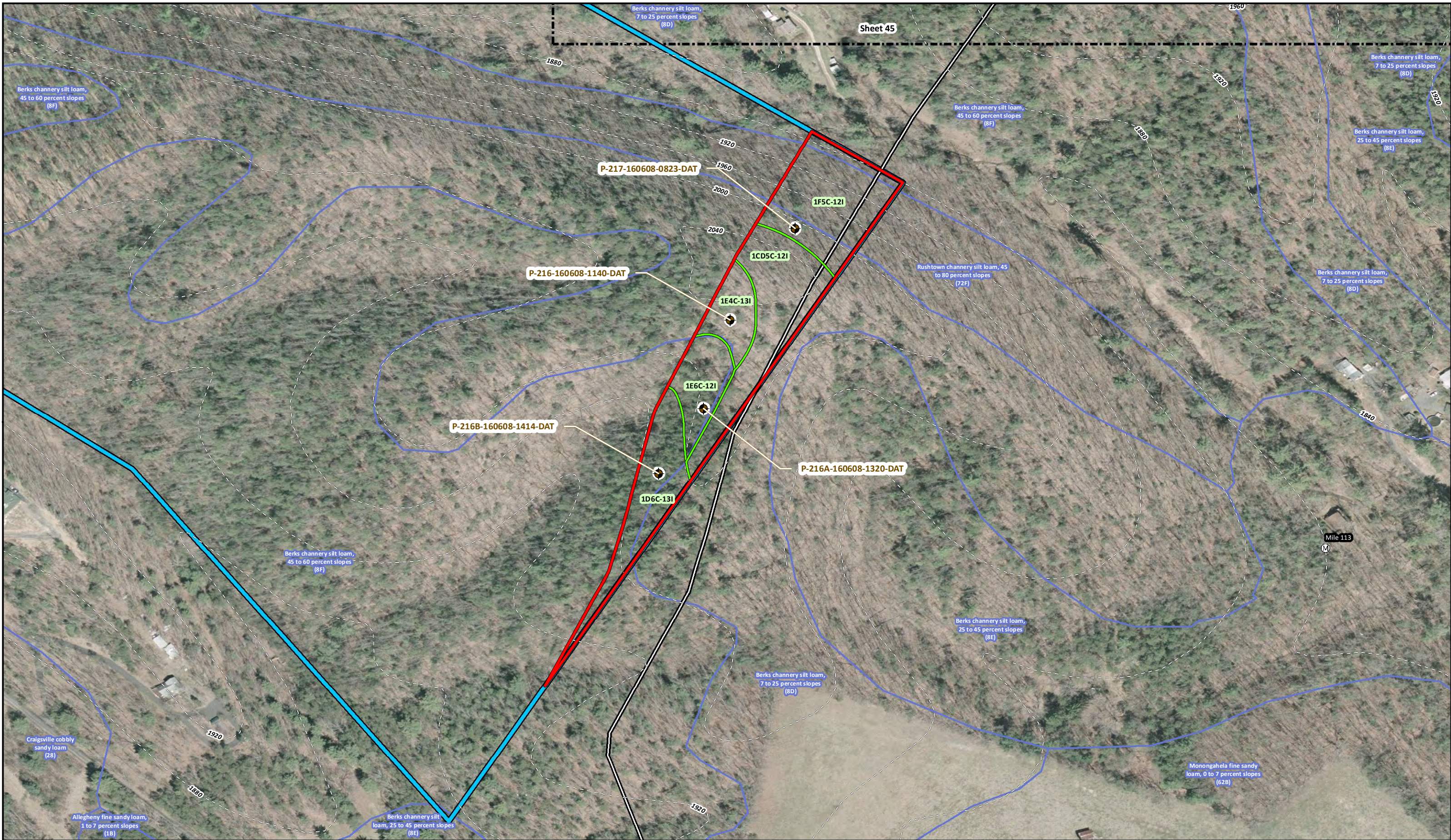
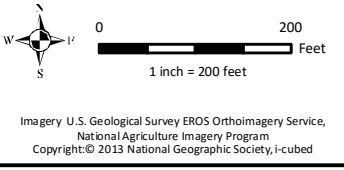
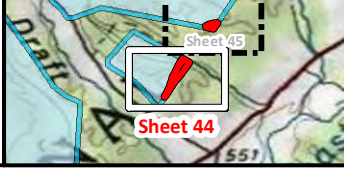


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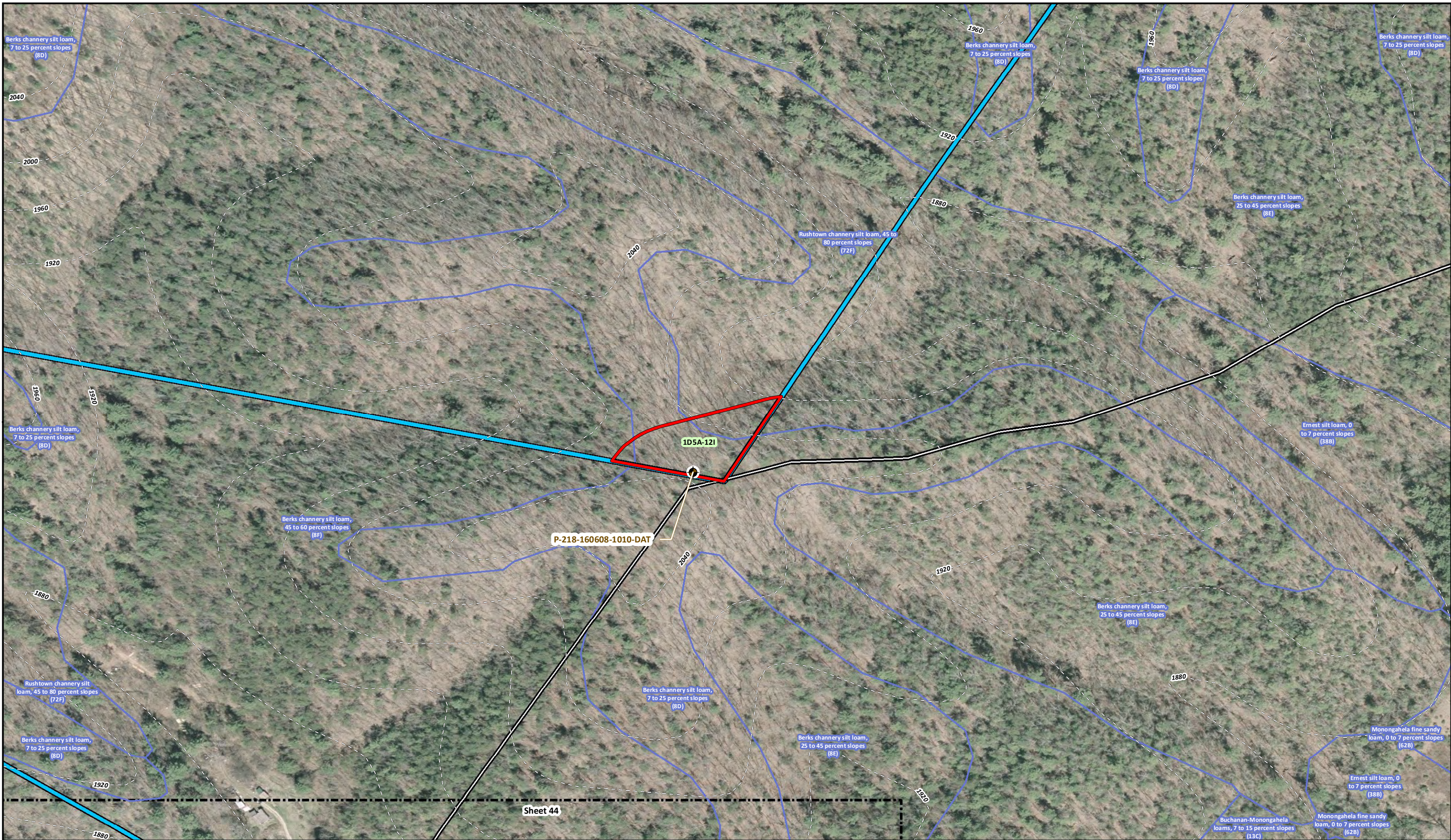
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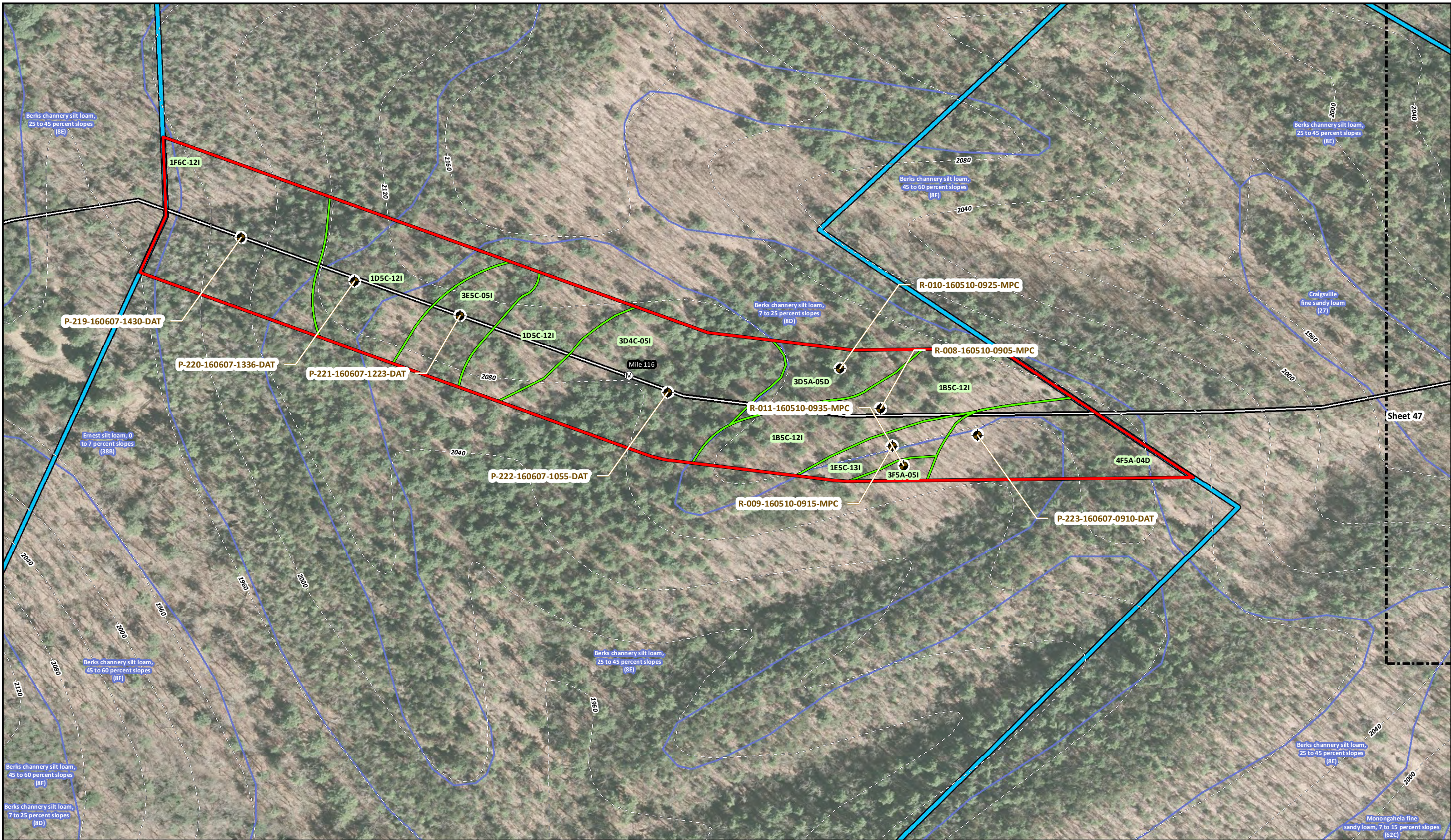


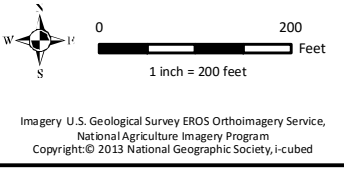
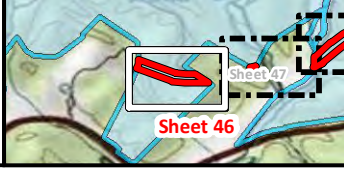
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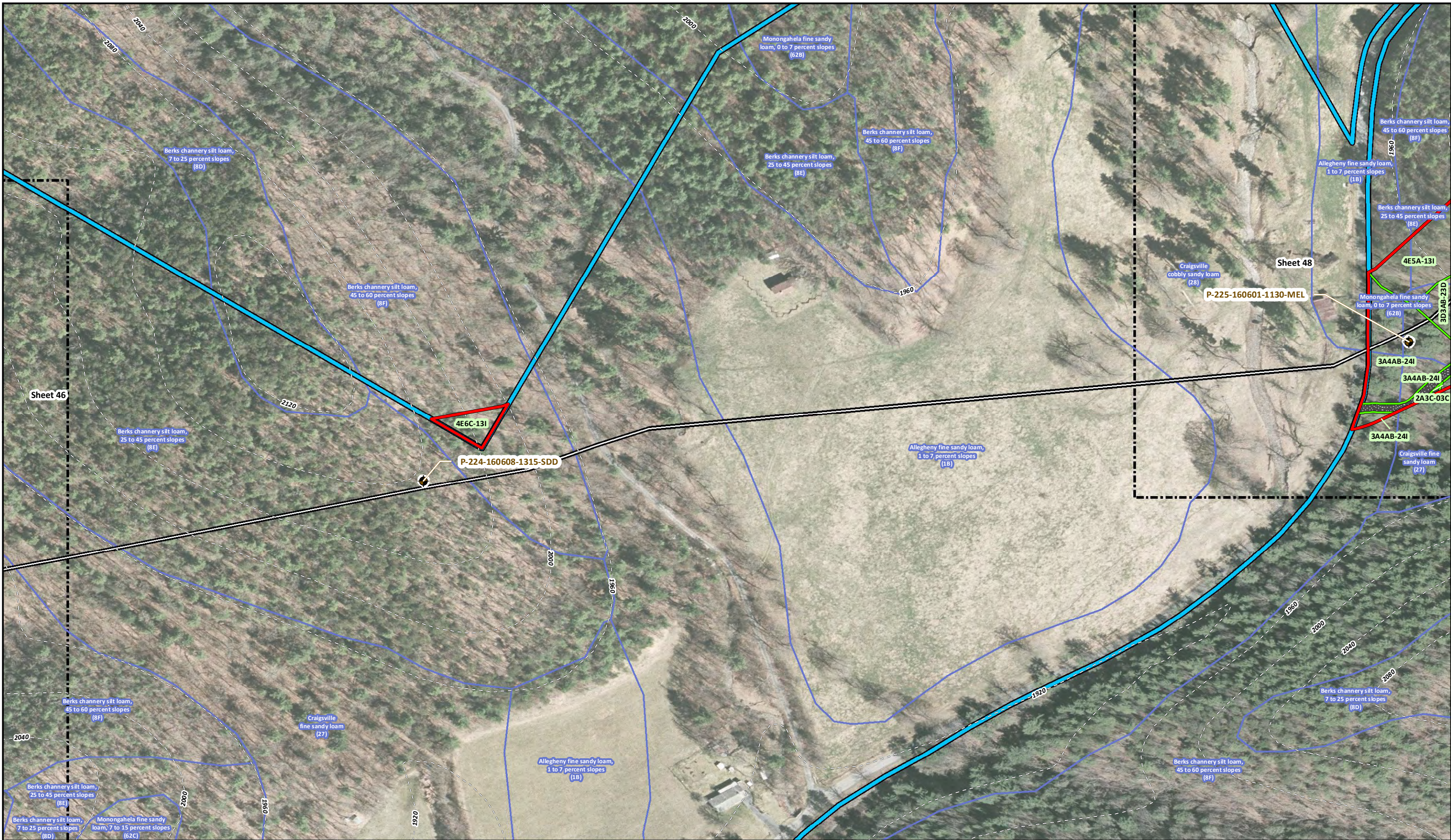


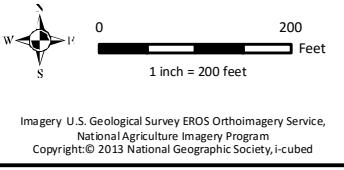
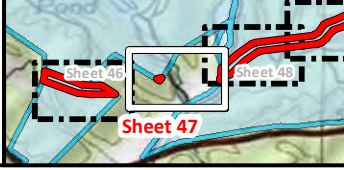
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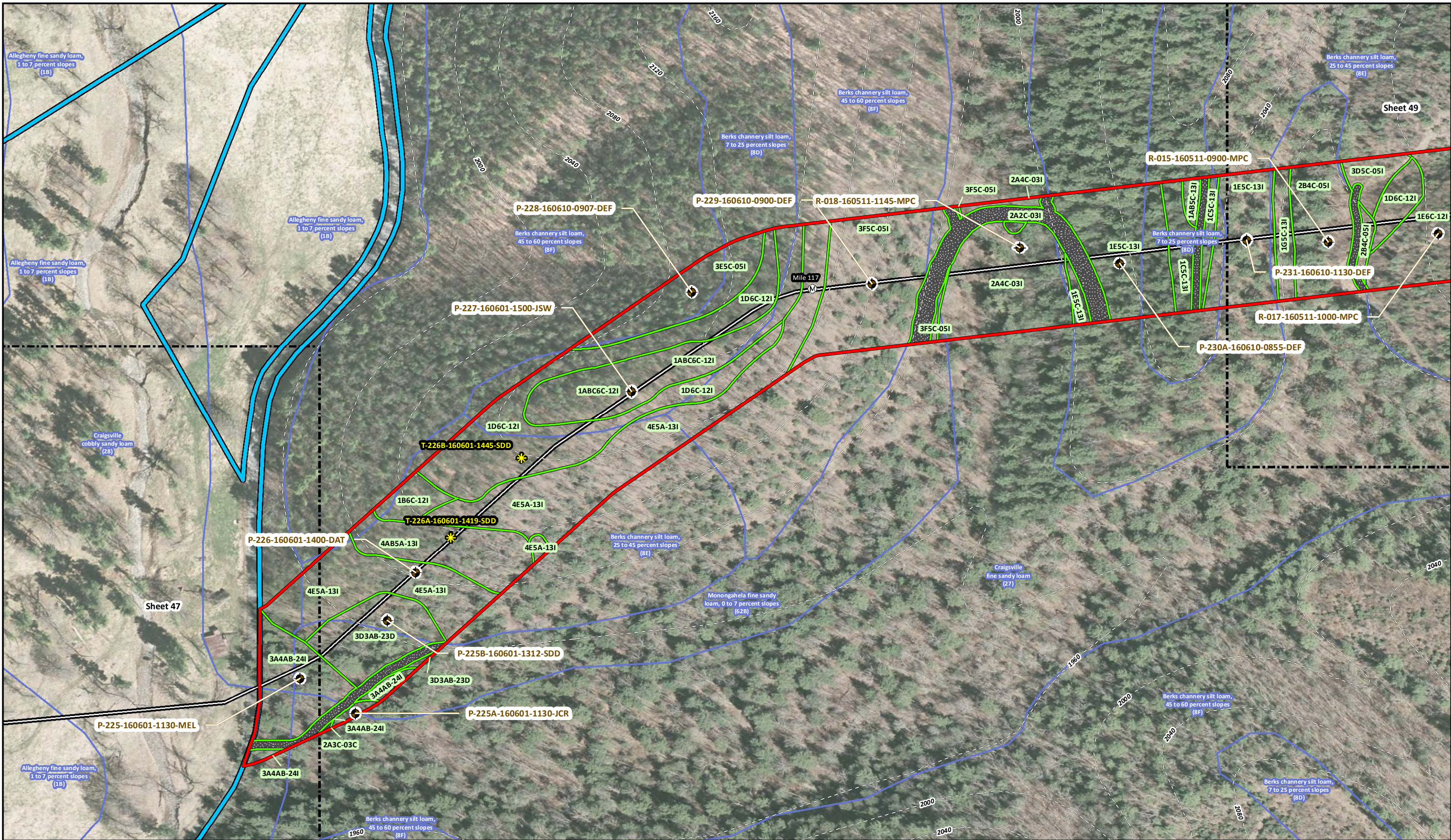


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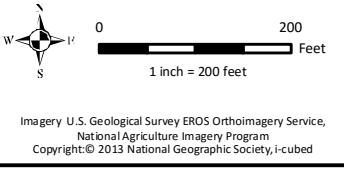
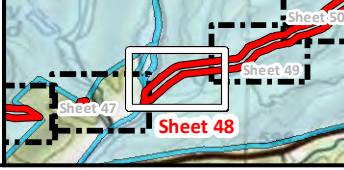
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- NRCS Soil Unit Boundary
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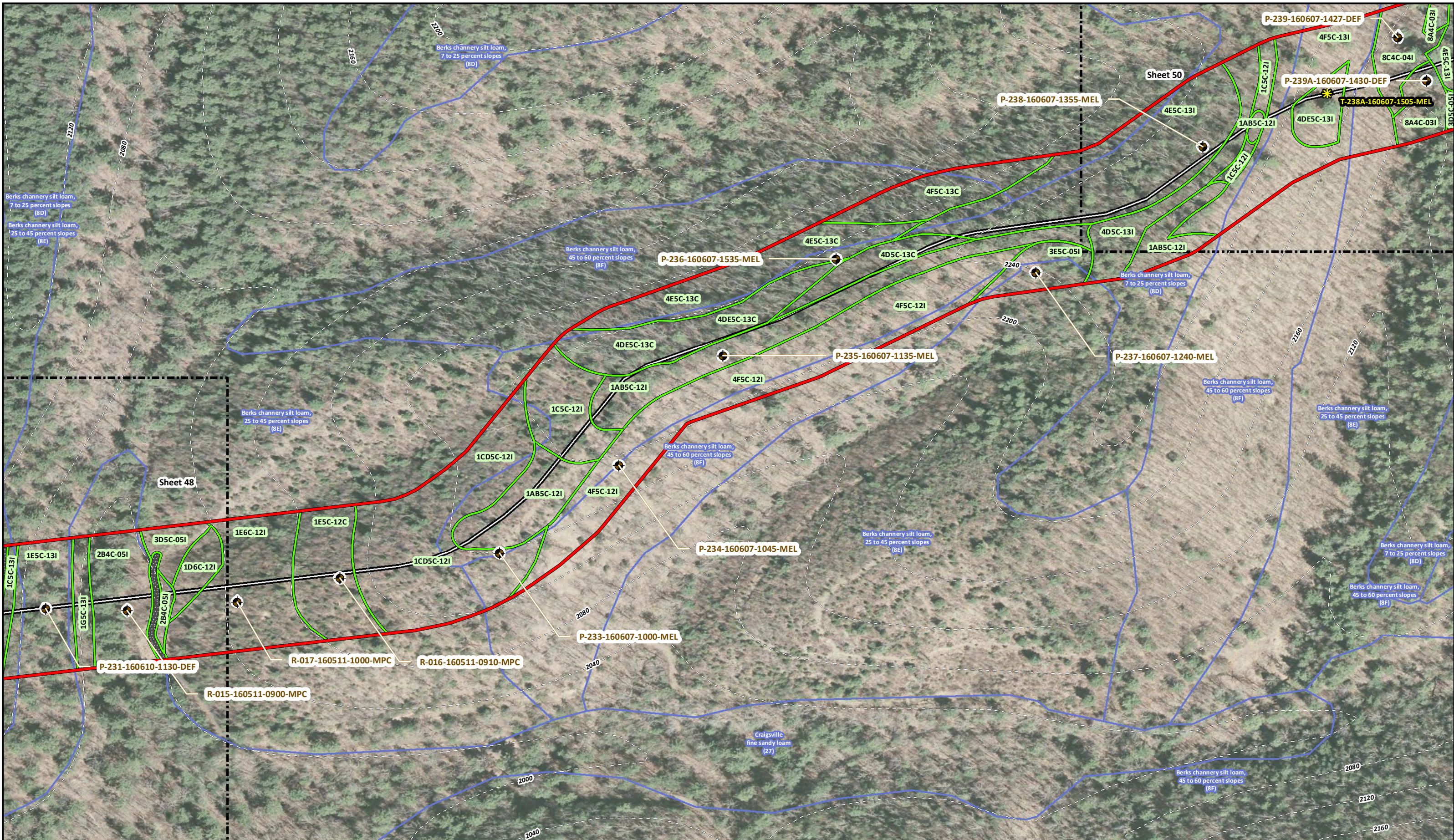


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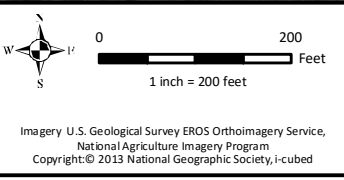
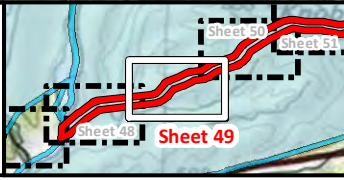
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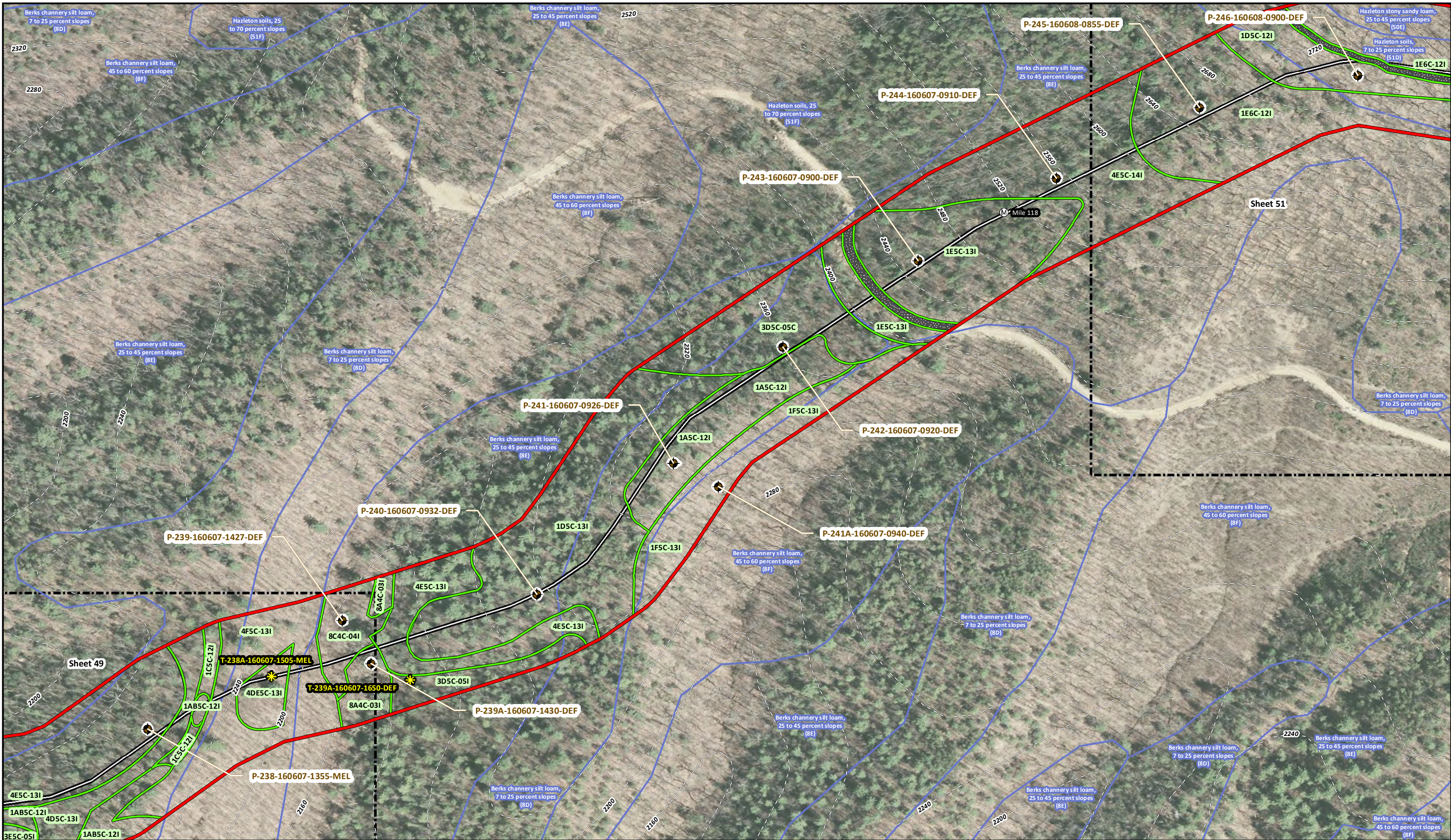


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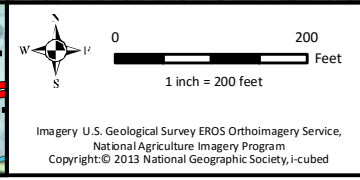
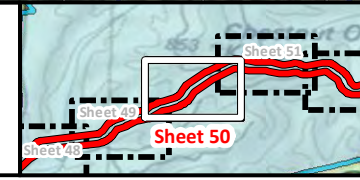
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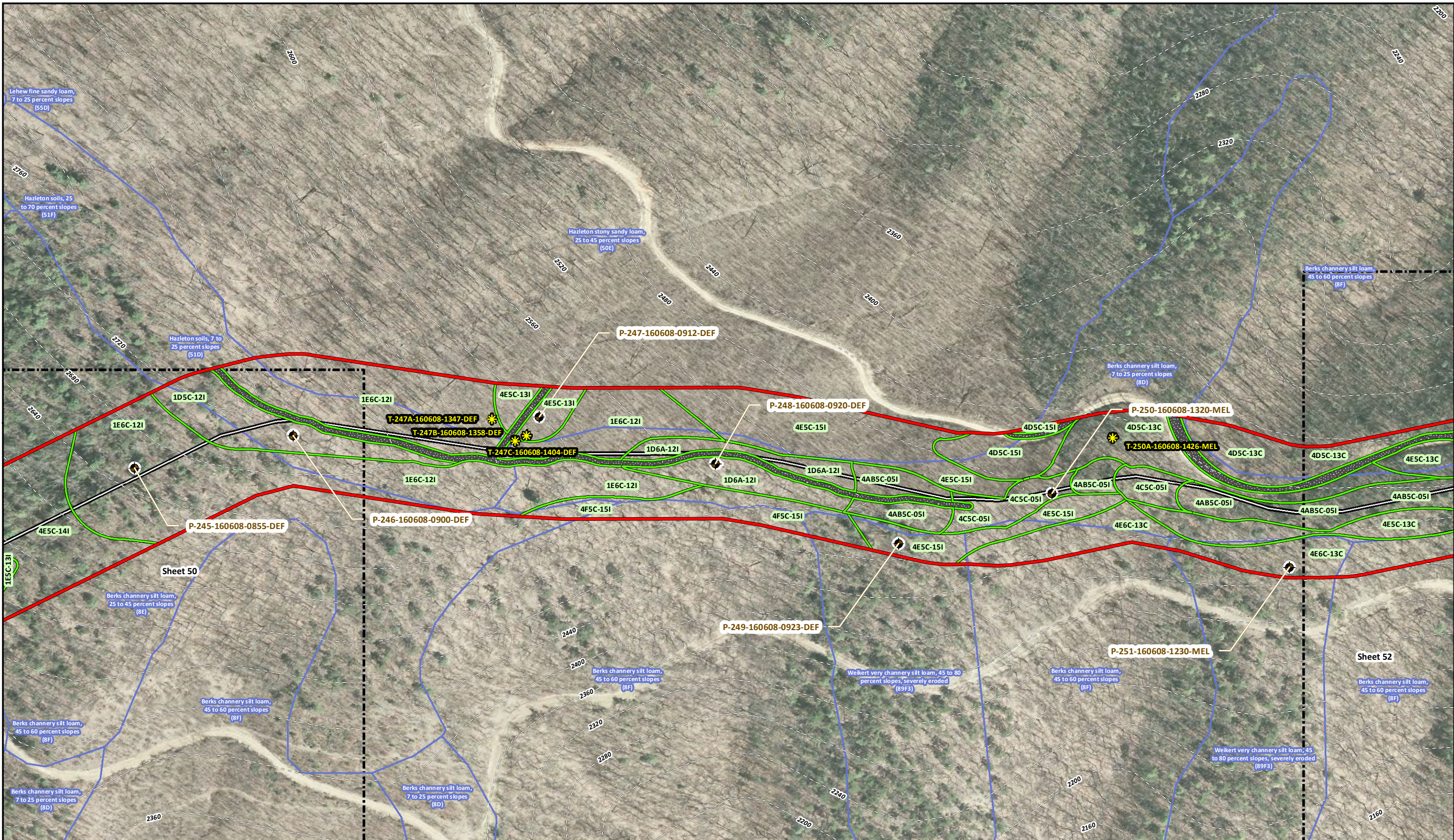


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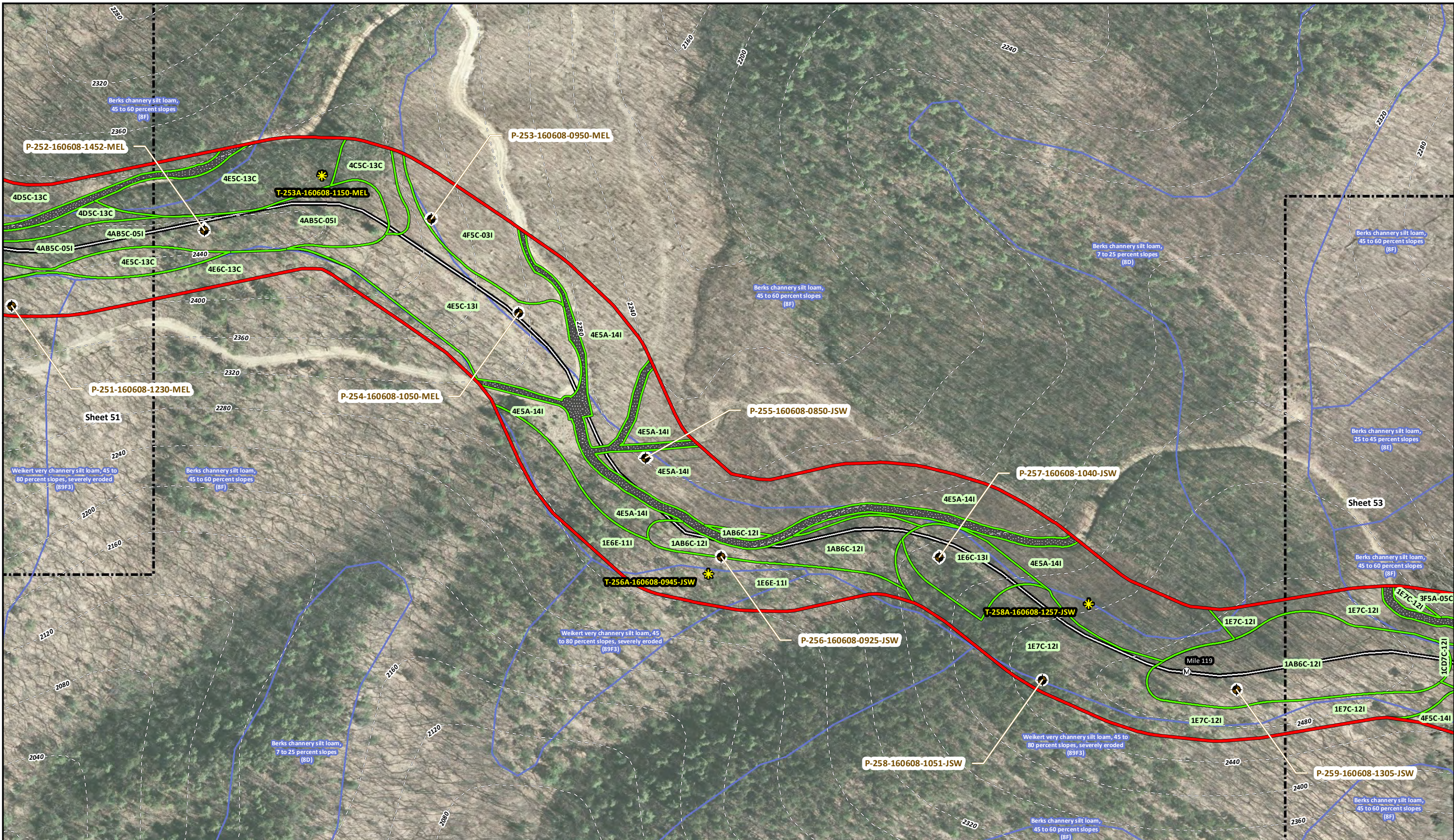
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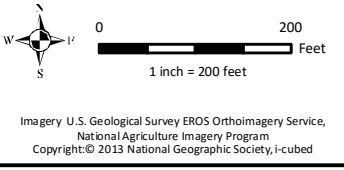
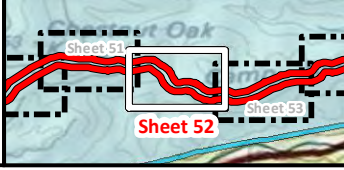
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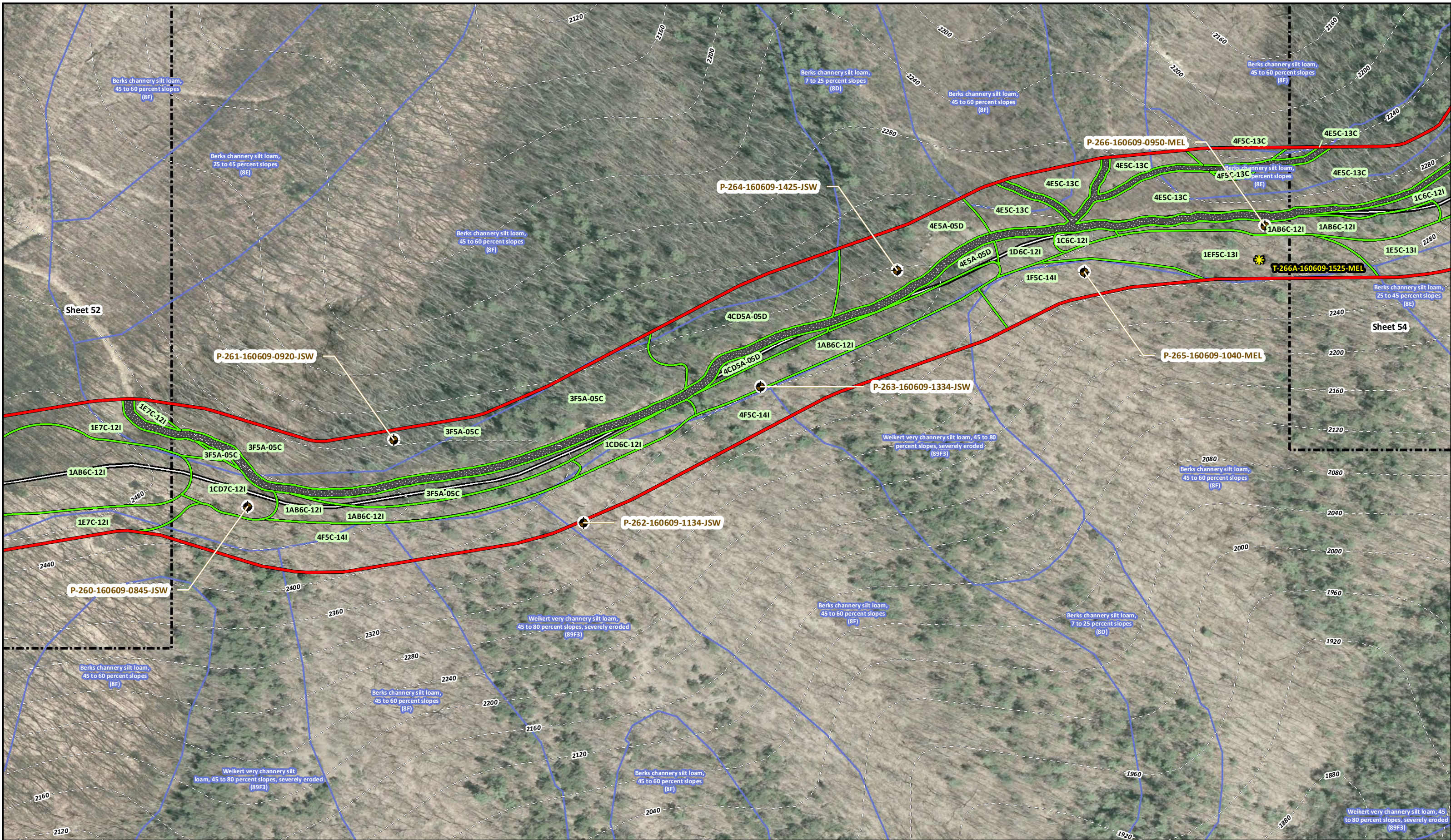


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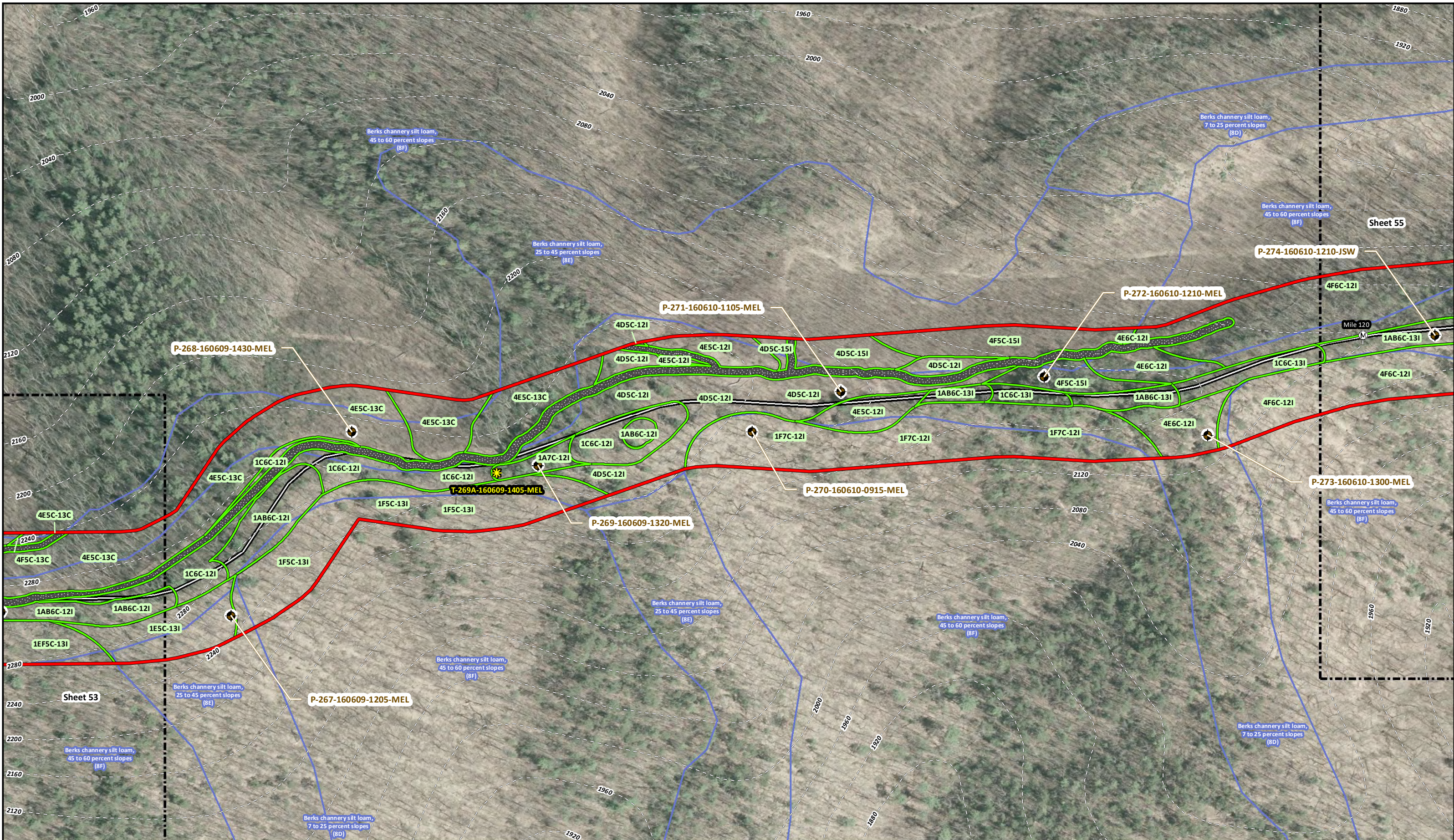
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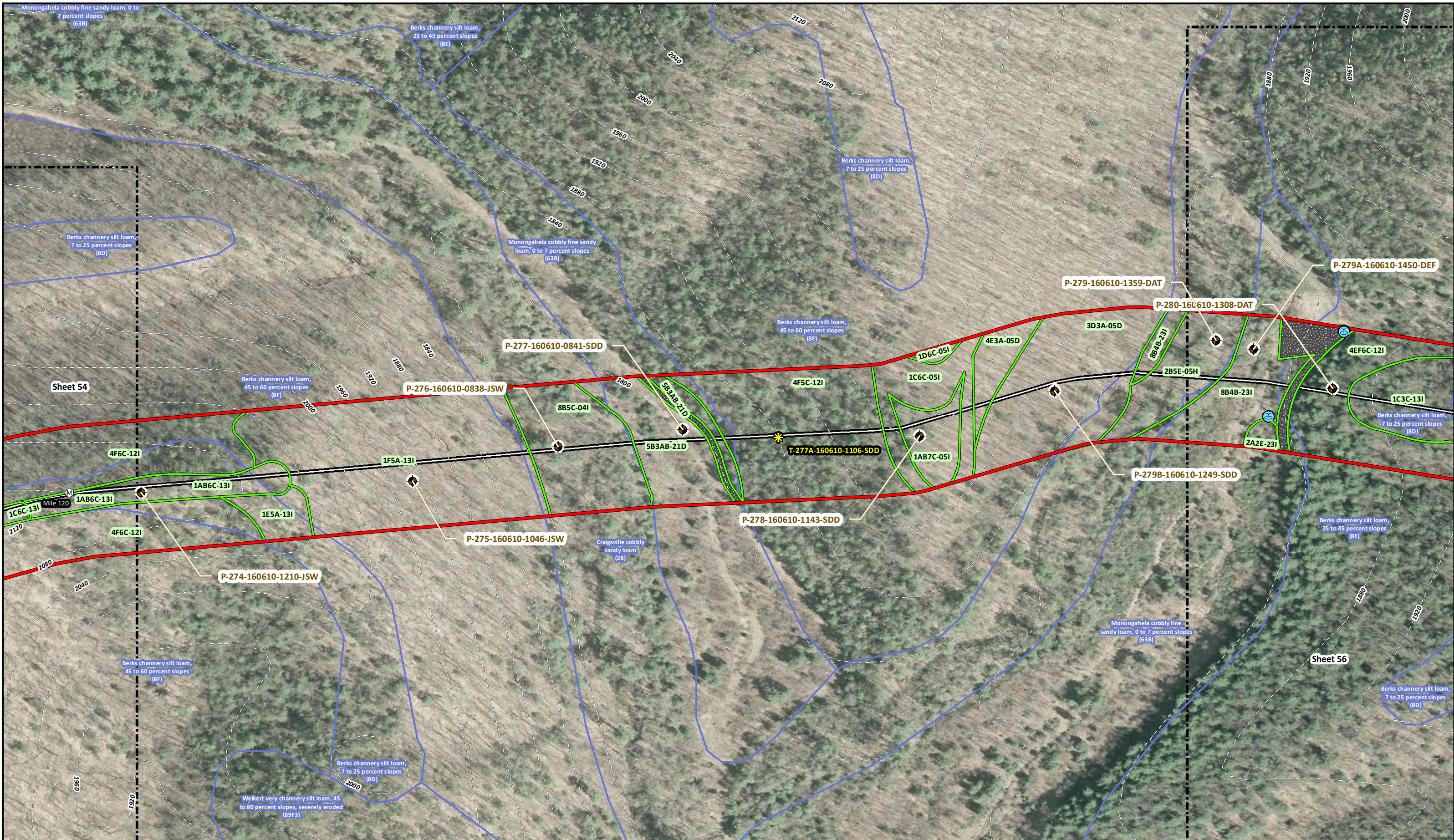
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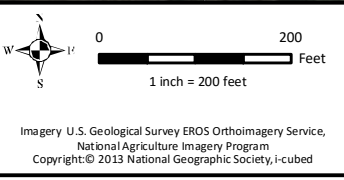
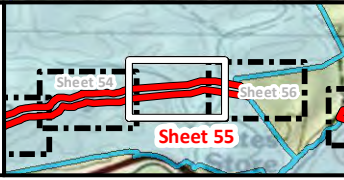
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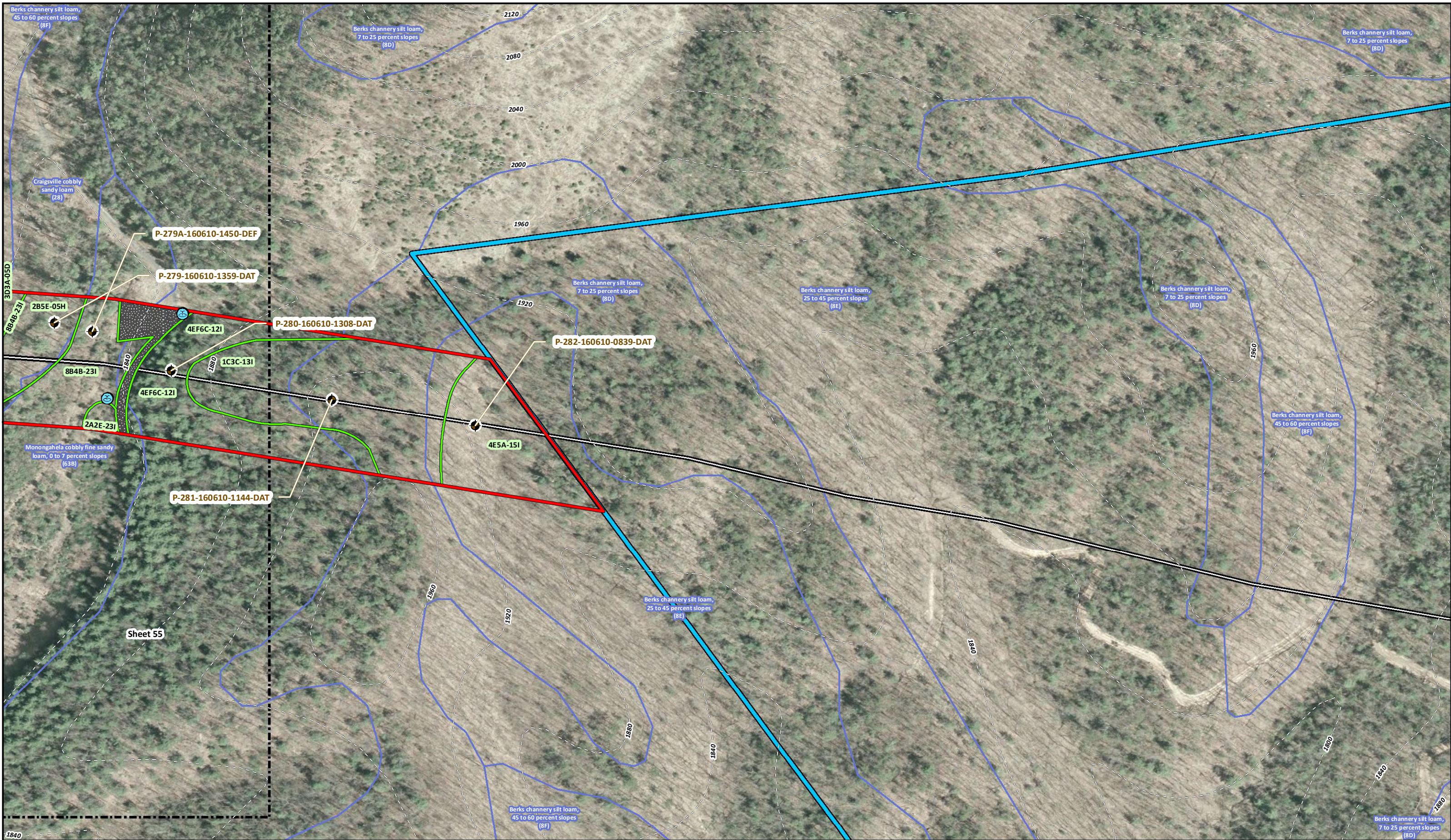


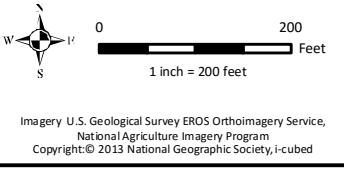
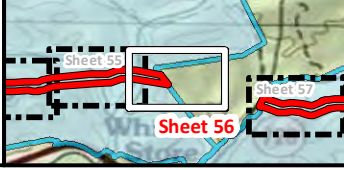
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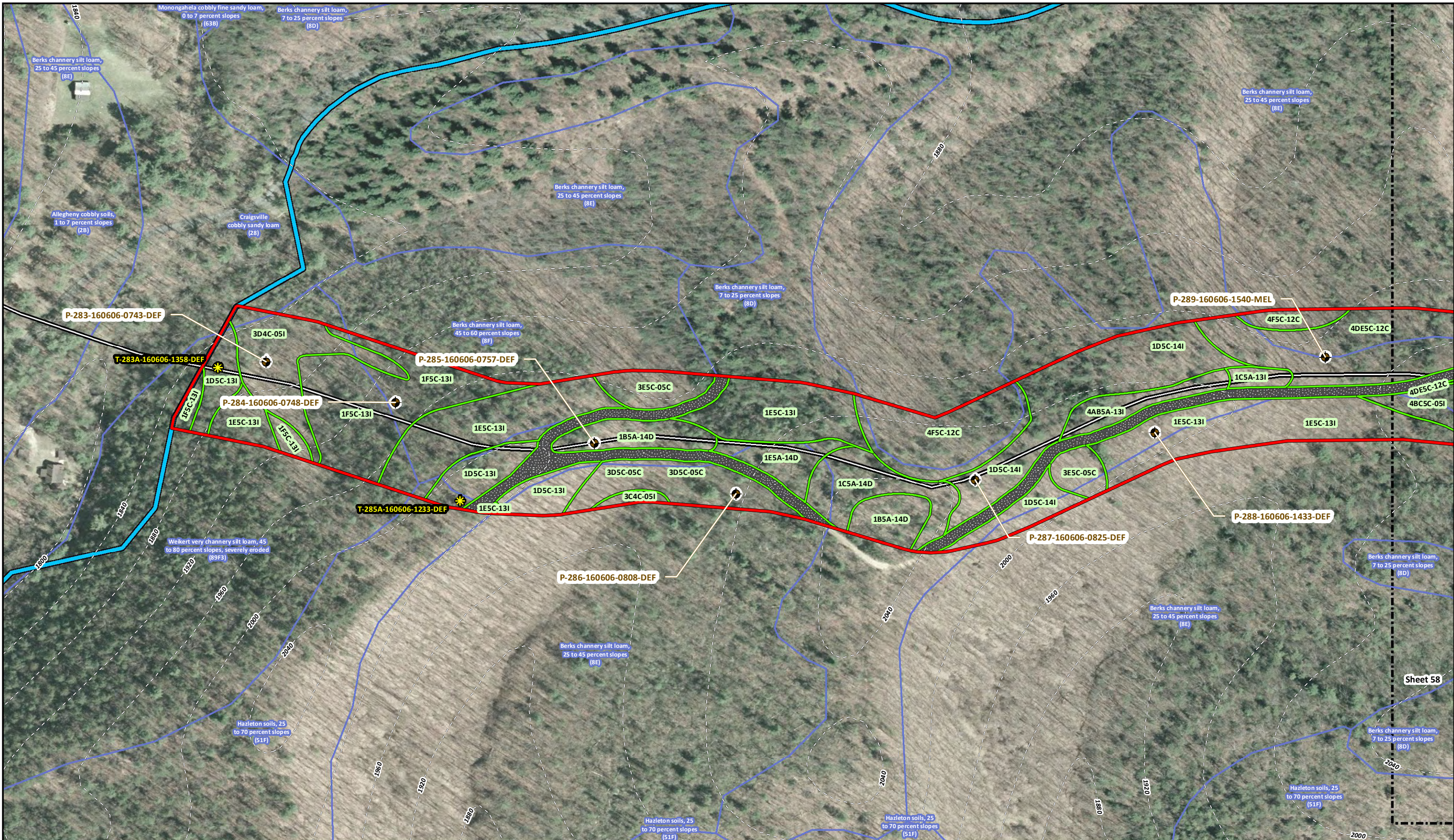


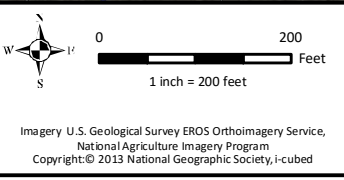
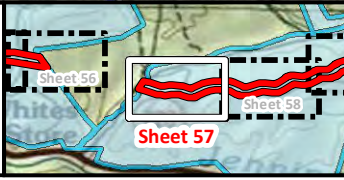


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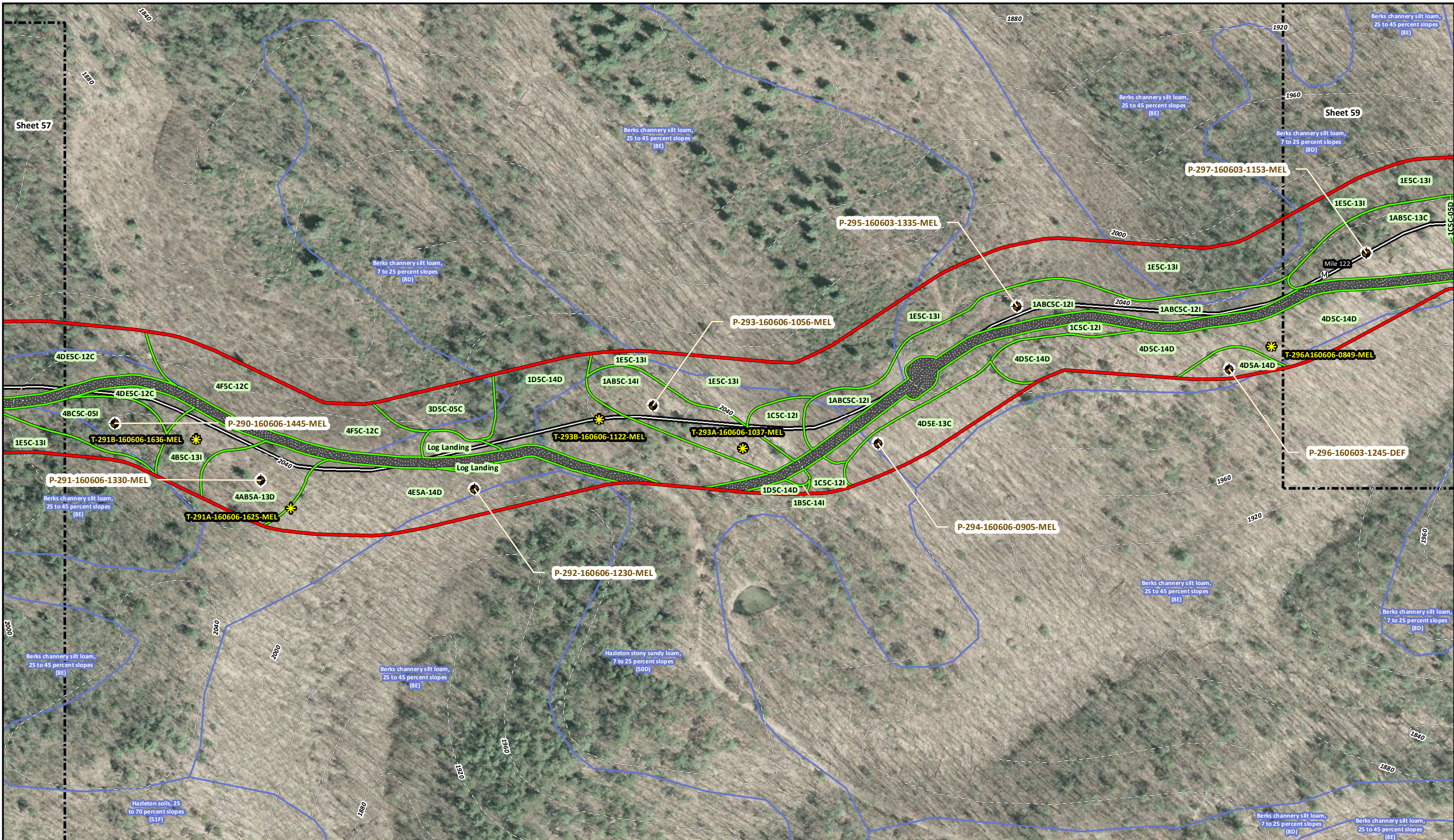


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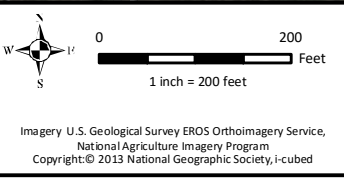
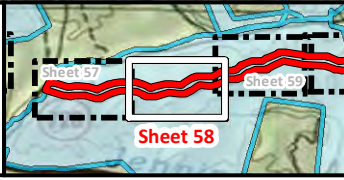
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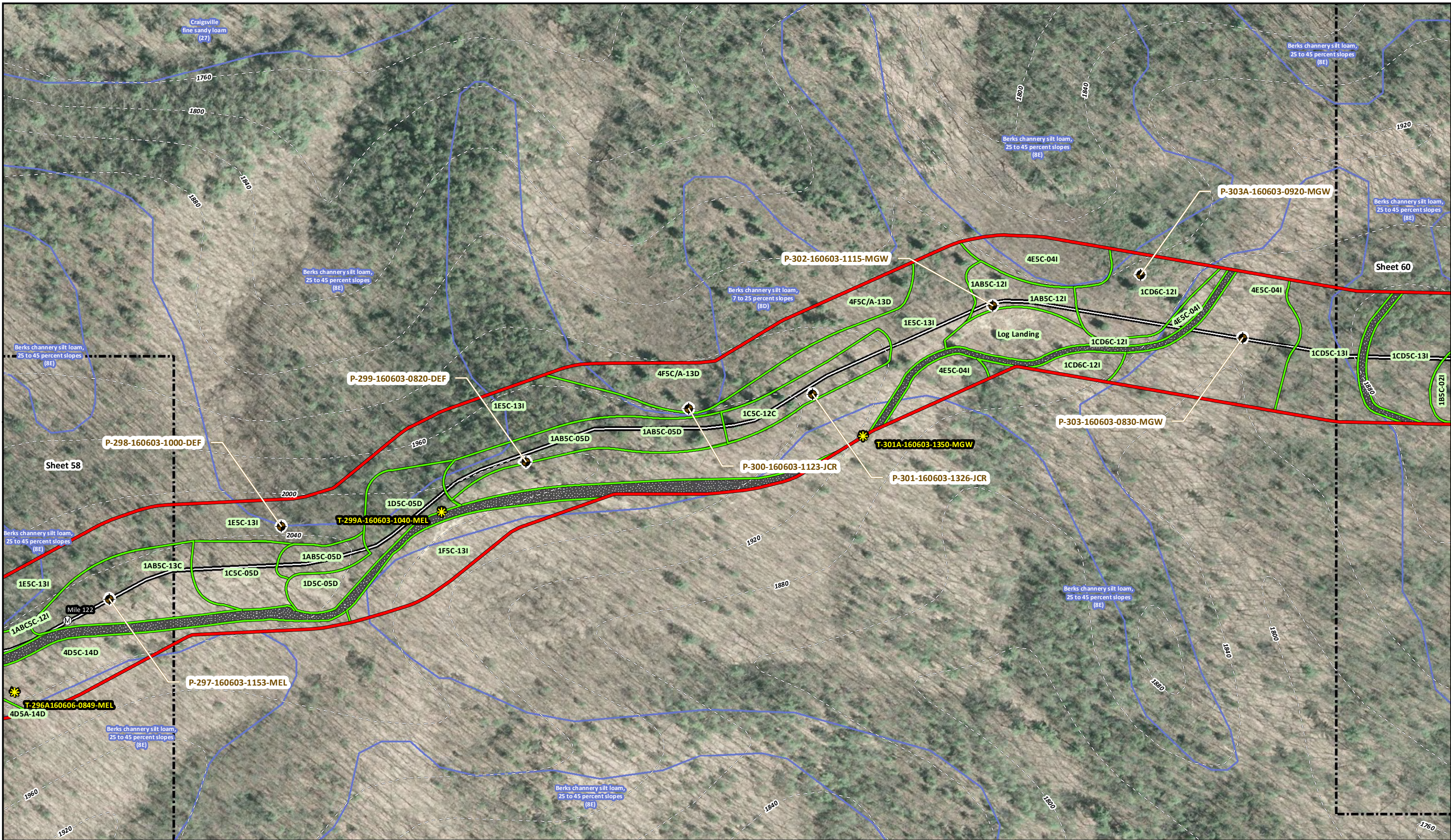


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- Monongahela National Forest
- NRCS Soil Unit Boundary
- Grid Sheet

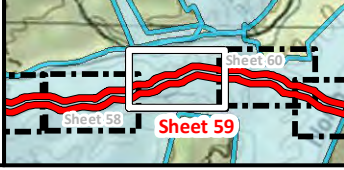


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0 200 Feet
1 inch = 200 feet

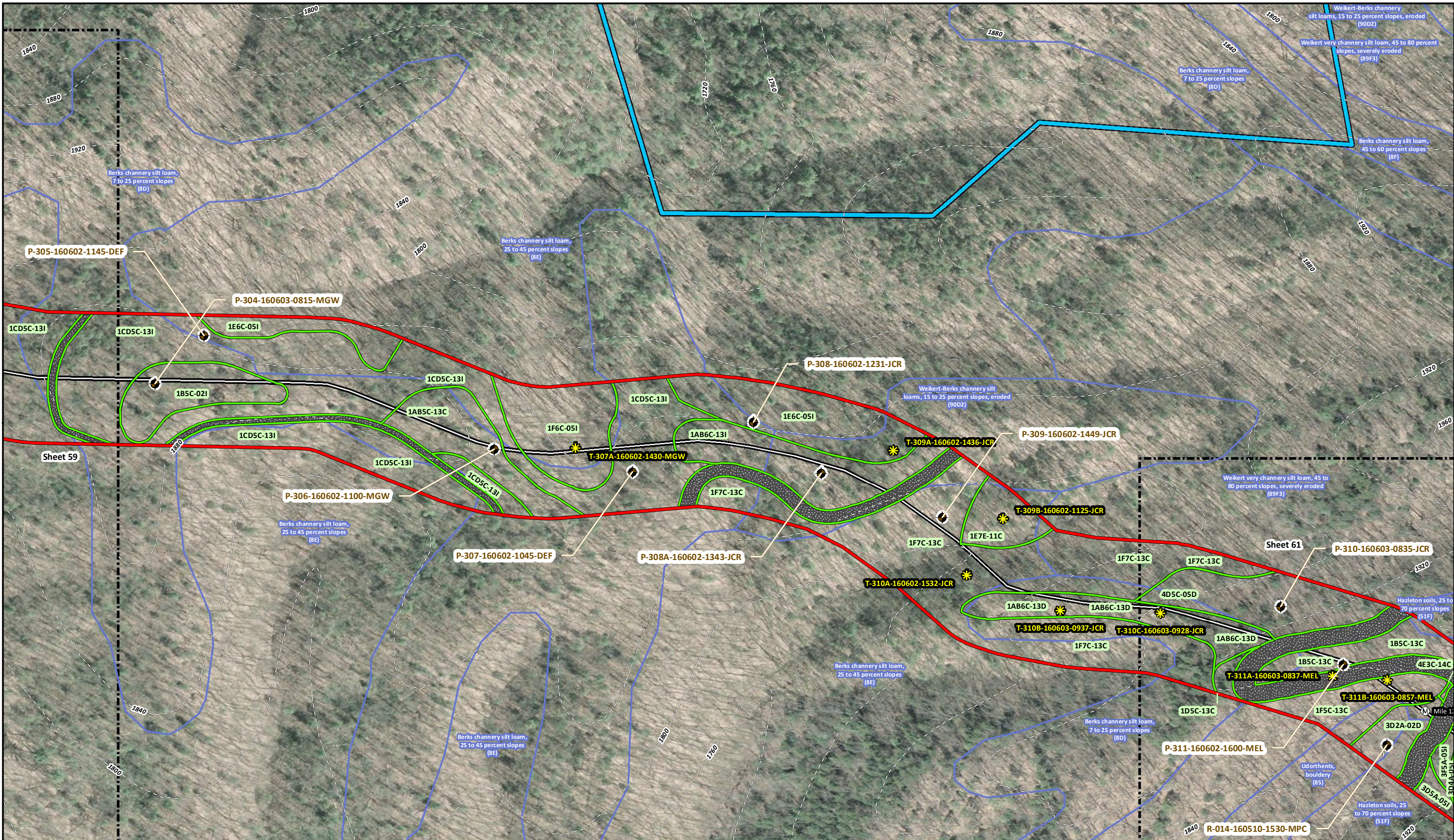
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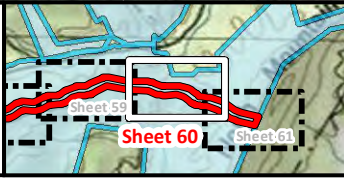
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Soil Test Pit	Approximate Property Marker	Centerline Alignment (Rev-10 & Rev-11)	Area of Investigation	NRC Soil Unit Boundary
Proposed Pit Location	Depression	Elevation Contour (40' Interval)	Soil Unit Boundary (ID Key in Attachment 6)	Grid Sheet
Transect Location	Rock Outcrop	Revised Area of Investigation	George Washington National Forest	
Mile Post	Spring	Road	Monongahela National Forest	



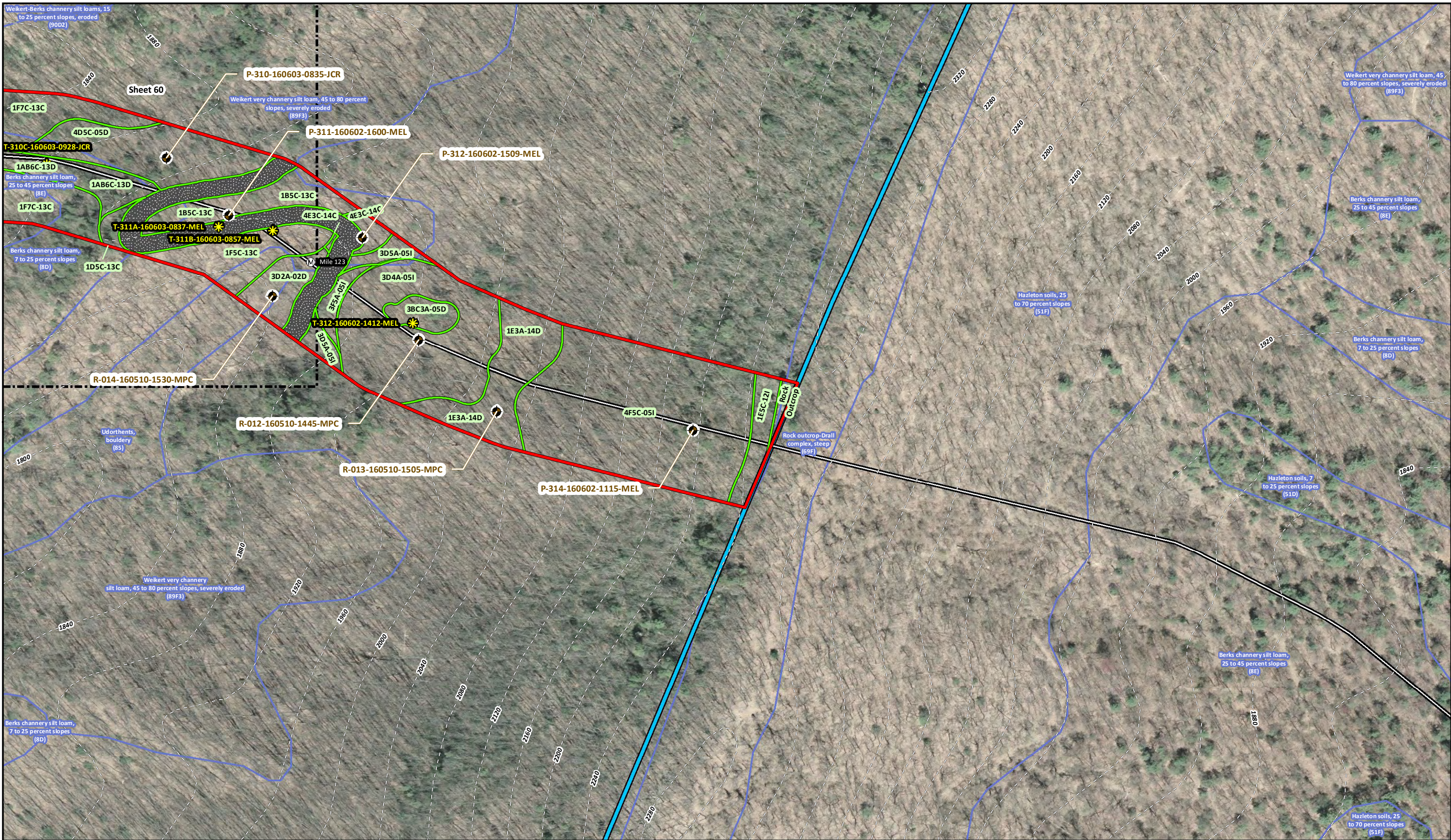
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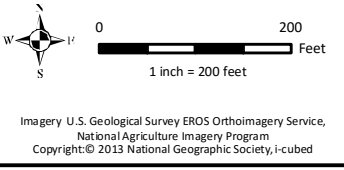
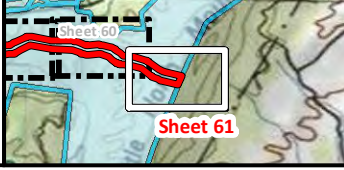
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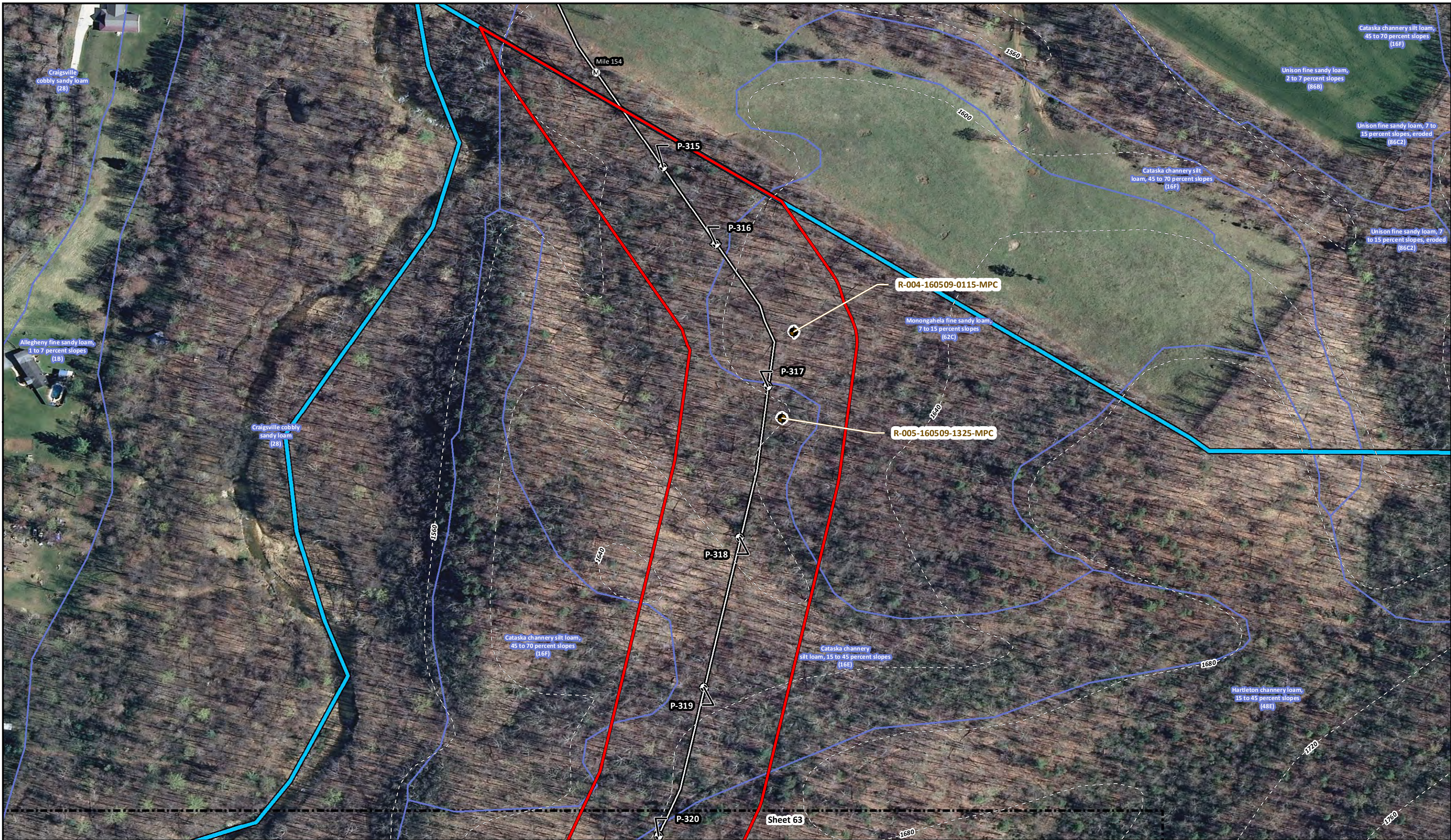




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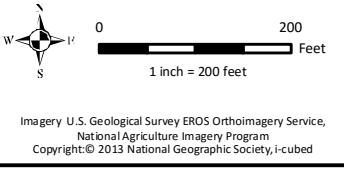
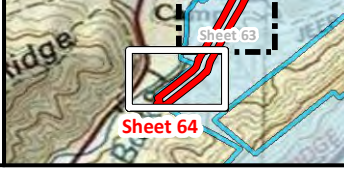


<ul style="list-style-type: none"> Soil Test Pit Proposed Pit Location Transect Location Mile Post 	<ul style="list-style-type: none"> Approximate Property Marker Depression Rock Outcrop Spring 	<ul style="list-style-type: none"> Centerline Alignment (Rev-10 & Rev-11) Elevation Contour (40' Interval) Revised Area of Investigation Road 	<ul style="list-style-type: none"> Area of Investigation Soil Unit Boundary (ID Key in Attachment 6) George Washington National Forest Monongahela National Forest 	<ul style="list-style-type: none"> NRCs Soil Unit Boundary Grid Sheet 			<p>Geosyntec consultants RETTEW</p> <p>Rev. 7/29/2016</p>	<p>Geosyntec Consultants Atlantic Coast Pipeline Order 1 Soil Survey Soil Survey Sheet 62 of 64</p> <p>Augusta County, VA Project No. 089962000</p>
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<ul style="list-style-type: none"> Soil Test Pit Proposed Pit Location Transect Location Mile Post 	<ul style="list-style-type: none"> Approximate Property Marker Depression Rock Outcrop Spring 	<ul style="list-style-type: none"> Centerline Alignment (Rev-10 & Rev-11) Elevation Contour (40' Interval) Revised Area of Investigation Road 	<ul style="list-style-type: none"> Area of Investigation Soil Unit Boundary (ID Key in Attachment 6) George Washington National Forest Monongahela National Forest 	<ul style="list-style-type: none"> NRCs Soil Unit Boundary Grid Sheet 		<p>Imagery U.S. Geological Survey EROS Orthoimagery Service, National Agriculture Imagery Program Copyright © 2013 National Geographic Society, i-cubed</p>	<p>Geosyntec consultants RETTEW</p> <p>Rev. 7/29/2016</p> <p>Drawn By: john.deloretta</p>	<p>Geosyntec Consultants Atlantic Coast Pipeline Order 1 Soil Survey Soil Survey Sheet 63 of 64 Augusta County, VA Project No. 089962000</p>
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Drawn By:
john.deloretta

Geosyntec Consultants
Atlantic Coast Pipeline
Order 1 Soil Survey
Soil Survey Sheet 64 of 64
Augusta County, VA
Project No. 089962000

Attachment 2
Soil Observations Inventory

Attachment 2
Soil Observations Inventory

Pit ID	Latitude	Longitude	Date Completed	Recon Pit ID in Proximity to Proposed Pit Location
R-001-160509-1000-mpc	37.952402	-78.954518	5/9/2016	
R-002-160509-1015-mpc	37.952468	-78.954284	5/9/2016	
R-003-160509-1030-mpc	37.951977	-78.954424	5/9/2016	
R-004-160509-0115-mpc	37.957884	-78.952517	5/9/2016	
R-005-160509-1325-mpc	37.957340	-78.952591	5/9/2016	
R-006-160509-1440-mpc	37.954487	-78.953386	5/9/2016	
R-007-160509-1550-mpc	37.945590	-78.959757	5/9/2016	
R-008-160510-0905-mpc	38.279748	-79.305059	5/10/2016	
R-009-160510-0915-mpc	38.279512	-79.304987	5/10/2016	
R-010-160510-0925-mpc	38.279999	-79.305316	5/10/2016	
R-011-160510-0935-mpc	38.279388	-79.304916	5/10/2016	
R-012-160510-1445-mpc	38.289136	-79.189663	5/10/2016	
R-013-160510-1505-mpc	38.288686	-79.189174	5/10/2016	
R-014-160510-1530-mpc	38.289414	-79.190581	5/10/2016	
R-015-160511-0900-mpc	38.283984	-79.286735	5/11/2016	
R-016-160511-0910-mpc	38.284186	-79.285399	5/11/2016	
R-017-160511-1000-mpc	38.284035	-79.286044	5/11/2016	
R-018-160511-1145-mpc	38.283946	-79.288671	5/11/2016	
R-019-160512-1020-mpc	38.296192	-79.830505	5/12/2016	
R-020-160512-1040-mpc	38.296406	-79.830902	5/12/2016	
R-021-160512-1110-mpc	38.295833	-79.831598	5/12/2016	
R-022-160512-1155-mpc	38.295735	-79.832066	5/12/2016	
R-023-160512-1310-mpc	38.301294	-79.843867	5/12/2016	
R-024-160512-1320-mpc	38.301157	-79.844462	5/12/2016	
R-025-160512-1420-mpc	38.301275	-79.844862	5/12/2016	
R-026-160513-1000-mpc	38.303793	-79.876557	5/13/2016	
R-027-160513-1000-mpc	38.303200	-79.875676	5/13/2016	
R-028-160513-1210-mpc	38.307172	-79.880959	5/13/2016	
R-029-160513-1300-mpc	38.306252	-79.879547	5/13/2016	
P-001-160620-1005-rll	38.356501	-80.044239	6/20/2016	
P-002-160620-1020-rll	38.355709	-80.043621	6/20/2016	
P-003-160620-1025-rll	38.354937	-80.042923	6/20/2016	
P-004-160620-1035-rll	38.354360	-80.041709	6/20/2016	
P-005-160620-1425-rll	38.353575	-80.040974	6/20/2016	
P-006-160620-1509-dat	38.352888	-80.040474	6/20/2016	
P-007-160620-1245-dat	38.352047	-80.039620	6/20/2016	
P-008-160620-1057-dat	38.351315	-80.038940	6/20/2016	
P-009-160620-145-mgw	38.350353	-80.038561	6/20/2016	
P-010-160620-1315-mgw	38.349737	-80.037498	6/20/2016	
P-011-160620-1140-mgw	38.348694	-80.037833	6/20/2016	
P-012-160620-1115-mgw	38.347671	-80.037546	6/20/2016	
P-013			Eliminated	
P-014			Eliminated	
P-015			Eliminated	
P-016			Eliminated	

Attachment 2
Soil Observations Inventory

Pit ID	Latitude	Longitude	Date Completed	Recon Pit ID in Proximity to Proposed Pit Location
P-017			Eliminated	
P-018			Eliminated	
P-019			Eliminated	
P-020			Eliminated	
P-021			Eliminated	
P-022-160614-1050-jsw	38.308305	-79.882894	6/14/2016	
P-023-160614-1150-jsw	38.308021	-79.882344	6/14/2016	
P-024-160614-1440-jsw	38.307729	-79.881422	6/14/2016	
P-025				R-028
P-026				R-029
P-027-160617-0942-jcr	38.305168	-79.877995	6/17/2016	
P-028-160617-1100-jcr	38.304291	-79.877313	6/17/2016	
P-029				R-026
P-030				R-027
P-031-160615-1222-jsw	38.300029	-79.867333	6/15/2016	
P-032-160615-1215-jsw	38.299576	-79.866134	6/15/2016	
P-033-160615-1041-jsw	38.299787	-79.865002	6/15/2016	
P-034-160615-1019-jsw	38.300281	-79.863904	6/15/2016	
P-035-160615-1011-jsw	38.301076	-79.862377	6/15/2016	
P-036-160615-1557-jcr	38.301716	-79.862823	6/15/2016	
P-037-160615-1532-jcr	38.302059	-79.861940	6/15/2016	
P-038-160615-1455-jcr	38.302295	-79.860710	6/15/2016	
P-039-160615-1344-jcr	38.302321	-79.859367	6/15/2016	
P-040-160615-1119-jcr	38.302491	-79.857884	6/15/2016	
P-041-160614-1453-jcr	38.302854	-79.856950	6/14/2016	
P-042-160614-1355-jcr	38.302362	-79.855830	6/14/2016	
P-043-160614-1317-jcr	38.302576	-79.854569	6/14/2016	
P-044-160614-1214-jcr	38.302101	-79.854101	6/14/2016	
P-045-160614-1019-jcr	38.301872	-79.852437	6/14/2016	
P-046-160614-1050-def	38.301691	-79.850540	6/14/2016	
P-047-160614-1045-def	38.301775	-79.849432	6/14/2016	
P-048-160614-1035-def	38.301967	-79.848513	6/14/2016	
P-049-160614-1025-def	38.301882	-79.847368	6/14/2016	
P-050-160614-1015-def	38.301561	-79.846265	6/14/2016	
P-051				R-025
P-052				R-023, R-024
P-053-160613-1105-rll	38.300312	-79.842855	6/13/2016	
P-053A-160613-1422-rll	38.300447	-79.842245	6/13/2016	
P-054-160613-1055-rll	38.300134	-79.841903	6/13/2016	
P-055-160613-1110-rll	38.300020	-79.841065	6/13/2016	
P-056-160613-1117-rll	38.299526	-79.839981	6/13/2016	
P-057-160613-1041-jdf	38.298813	-79.839357	6/13/2016	
P-058-160613-1057-jdf	38.297772	-79.838768	6/13/2016	
P-059-160613-1107-jdf	38.296796	-79.837805	6/13/2016	
P-060-160613-1555-rll	38.296698	-79.836665	6/13/2016	

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Soil Observations Inventory

Pit ID	Latitude	Longitude	Date Completed	Recon Pit ID in Proximity to Proposed Pit Location
P-061-160614-1000-rl	38.295846	-79.836047	6/14/2016	
P-062-160614-1005-rl	38.295981	-79.834770	6/14/2016	
P-063-160614-0950-rl	38.295626	-79.834086	6/14/2016	
P-064-160614-1020-rl	38.295890	-79.832618	6/14/2016	R-022
P-065				R-019, R-020, R-021
P-066-160614-1040-rl	38.296401	-79.829655	6/14/2016	
P-067-160614-1441-sdd	38.297210	-79.828987	6/14/2016	
P-068-160614-1338-sdd	38.297316	-79.828113	6/14/2016	
P-069-160614-1158-sdd	38.298404	-79.827744	6/14/2016	
P-070-160614-1102-sdd	38.298595	-79.825943	6/14/2016	
P-071-160614-1001-sdd	38.298923	-79.824980	6/14/2016	
P-072-160616-1447-sdd	38.299743	-79.824200	6/16/2016	
P-073-160616-1402-sdd	38.300615	-79.823901	6/16/2016	
P-074-160616-1238-sdd	38.301802	-79.823552	6/16/2016	
P-075-160616-1140-sdd	38.302403	-79.823165	6/16/2016	
P-076-160616-1055-sdd	38.303121	-79.822682	6/16/2016	
P-077-160617-1035-sdd	38.303800	-79.821430	6/17/2016	
P-078-160617-1201-sdd	38.304679	-79.821019	6/17/2016	
P-079-160617-1251-sdd	38.304881	-79.820072	6/17/2016	
P-080-160617-1000-def	38.305791	-79.818303	6/17/2016	
P-081-160617-1010-def	38.306183	-79.817589	6/17/2016	
P-082-160617-1020-jsw	38.306462	-79.816438	6/17/2016	
P-083-160617-1011-jsw	38.306022	-79.815850	6/17/2016	
P-084-160617-1005-jsw	38.304966	-79.815119	6/17/2016	
P-085-160616-1039-jcr	38.304130	-79.814666	6/16/2016	
P-086-160616-1149-jcr	38.303356	-79.812749	6/16/2016	
P-087-160616-1316-jcr	38.303904	-79.812843	6/16/2016	
P-088-160616-1506-jcr	38.304539	-79.811462	6/16/2016	
P-089-160616-1550-jcr	38.304925	-79.810648	6/16/2016	
P-090-160609-1005-sdd	38.304932	-79.809975	6/9/2016	
P-091-160609-1223-sdd	38.304710	-79.809071	6/9/2016	
P-092-160609-1432-sdd	38.304543	-79.808024	6/9/2016	
P-093-160609-1531-sdd	38.303955	-79.806488	6/9/2016	
P-094-160609-1541-dat	38.303520	-79.805660	6/9/2016	
P-095-160609-1357-dat	38.303646	-79.804292	6/9/2016	
P-096-160609-1223-dat	38.303490	-79.803135	6/9/2016	
P-097-160609-1039-dat	38.303173	-79.802250	6/9/2016	
P-098-160609-1040-def	38.303263	-79.800705	6/9/2016	
P-099-160609-1055-def	38.302560	-79.799324	6/9/2016	
P-100-160609-1105-def	38.301881	-79.799103	6/9/2016	
P-101-160609-1115-def	38.301743	-79.798020	6/9/2016	
P-101A-160609-1605-def	38.301883	-79.798245	6/9/2016	
P-102-160613-1106-jsw	38.301912	-79.796503	6/13/2016	
P-103-160613-1111-jsw	38.302013	-79.795278	6/13/2016	
P-104-160613-1400-jsw	38.302846	-79.794265	6/13/2016	

Attachment 2
Soil Observations Inventory

Pit ID	Latitude	Longitude	Date Completed	Recon Pit ID in Proximity to Proposed Pit Location
P-105-160613-1415-jsw	38.301947	-79.793243	6/13/2016	
P-106-160613-1411-jsw	38.301428	-79.792558	6/13/2016	
P-107-160613-1053-sdd	38.301596	-79.790871	6/13/2016	
P-108-160613-1217-sdd	38.301164	-79.790080	6/13/2016	
P-109-160613-1321-sdd	38.301313	-79.788595	6/13/2016	
P-110-160613-1503-sdd	38.301180	-79.787215	6/13/2016	
P-111-160613-1602-sdd	38.301737	-79.786555	6/13/2016	
P-112-160613-1505-jcr	38.302278	-79.785411	6/13/2016	
P-113-160613-1438-jcr	38.302772	-79.784282	6/13/2016	
P-114-160613-1325-jcr	38.303191	-79.783030	6/13/2016	
P-115-160613-1227-jcr	38.303665	-79.781869	6/13/2016	
P-116-160613-1016-jcr	38.303954	-79.781126	6/13/2016	
P-117-160616-1420-mgw	38.304416	-79.780106	6/16/2016	
P-118-160616-1030-mgw	38.304769	-79.778798	6/16/2016	
P-119-160616-1020-mgw	38.304975	-79.777492	6/16/2016	
P-120-160616-1010-mgw	38.305259	-79.776261	6/16/2016	
P-120A-160616-1225-mgw	38.305358	-79.775975	6/16/2016	
P-121-160616-0950-mgw	38.305537	-79.775429	6/16/2016	
P-122-160616-1000-mgw	38.305828	-79.774158	6/16/2016	
P-123-160615-1625-mgw	38.306251	-79.772983	6/15/2016	
P-124-160615-1346-mgw	38.306738	-79.771987	6/15/2016	
P-125-160615-1340-mgw	38.307228	-79.770957	6/15/2016	
P-126-160615-1410-mgw	38.307707	-79.769788	6/15/2016	
P-127-160615-1110-mgw	38.307661	-79.768563	6/15/2016	
P-128-160615-1050-mgw	38.307875	-79.767364	6/15/2016	
P-129-160615-1045-rll	38.307498	-79.766538	6/15/2016	
P-130-160615-1050-rll	38.306802	-79.765543	6/15/2016	
P-131-160615-1100-rll	38.306366	-79.764290	6/15/2016	
P-132-160615-1110-rll	38.305352	-79.763448	6/15/2016	
P-133-160615-1115-rll	38.304630	-79.763271	6/15/2016	
P-134-160615-1506-sdd	38.303683	-79.762344	6/15/2016	
P-135-160615-1321-sdd	38.302842	-79.762407	6/15/2016	
P-136-160615-1239-sdd	38.302162	-79.761538	6/15/2016	
P-137-160615-1152-sdd	38.301221	-79.760986	6/15/2016	
P-138-160616-1219-def	38.300331	-79.760636	6/16/2016	
P-139-160616-1226-def	38.299345	-79.759903	6/16/2016	
P-139A-160616-1341-def	38.299328	-79.760135	6/16/2016	
P-140-160616-1231-def	38.298694	-79.759614	6/16/2016	
P-141-160616-1235-def	38.297724	-79.759077	6/16/2016	
P-142-160616-1240-def	38.296871	-79.758657	6/16/2016	
P-143-160616-1735-def	38.296291	-79.757992	6/16/2016	
P-144-160616-1200-jsw	38.295255	-79.757351	6/16/2016	
P-145-160616-1145-jsw	38.294754	-79.756263	6/16/2016	
P-146-160616-1127-jsw	38.294025	-79.755464	6/16/2016	
P-147-160616-1059-jsw	38.293524	-79.754110	6/16/2016	

Attachment 2
Soil Observations Inventory

Pit ID	Latitude	Longitude	Date Completed	Recon Pit ID in Proximity to Proposed Pit Location
P-148-160616-1044-jsw	38.292790	-79.753546	6/16/2016	
P-149-160616-1033-jsw	38.292573	-79.752445	6/16/2016	
P-150-160616-1024-jsw	38.291644	-79.751414	6/16/2016	
P-151-160606-1107-sdd	38.183683	-79.679407	6/6/2016	
P-152-160606-1251-sdd	38.183459	-79.678916	6/6/2016	
P-153-160606-1408-sdd	38.182786	-79.677620	6/6/2016	
P-154-160606-1619-sdd	38.181973	-79.677315	6/6/2016	
P-155-160606-1110-dat	38.181152	-79.676595	6/6/2016	
P-156-160606-1355-dat	38.180541	-79.675798	6/6/2016	
P-157-160606-1512-dat	38.179647	-79.674959	6/6/2016	
P-158-160606-1717-jsw	38.178948	-79.674212	6/6/2016	
P-159-160606-1400-jsw	38.178370	-79.673304	6/6/2016	
P-160-160606-1210-jsw	38.177874	-79.672192	6/6/2016	
P-161-160606-1130-jsw	38.177421	-79.671198	6/6/2016	
P-162-160606-1040-jsw	38.177136	-79.670363	6/6/2016	
P-163-160620-1126-jsw	38.154679	-79.633820	6/20/2016	
P-164-160620-1117-jsw	38.154476	-79.632648	6/20/2016	
P-165-160620-1112-jsw	38.154131	-79.631737	6/20/2016	
P-166-160620-1107-jsw	38.153580	-79.631036	6/20/2016	
P-167-160620-1037-jsw	38.152868	-79.630613	6/20/2016	
P-168			ELIMINATED	
P-169			ELIMINATED	
P-170-160620-1122-def	38.149840	-79.628376	6/20/2016	
P-171-160620-1045-def	38.149148	-79.628350	6/20/2016	
P-172-160620-1117-def	38.148558	-79.628504	6/20/2016	
P-173-160620-1112-def	38.147356	-79.628614	6/20/2016	
P-174-160621-1145-rll	38.139431	-79.631647	6/21/2016	
P-175-160621-1150-rll	38.138955	-79.631418	6/21/2016	
P-176-160621-1155-rll	38.138033	-79.631086	6/21/2016	
P-177-160622-1027-jsw	38.137256	-79.630996	6/22/2016	
P-178-160621-1157-dat	38.136317	-79.630442	6/21/2016	
P-179-160621-1215-jsw	38.135952	-79.629530	6/22/2016	
P-180-160621-1252-jsw	38.135322	-79.628636	6/22/2016	
P-181-160621-1300-jsw	38.134756	-79.627370	6/22/2016	
P-182-160621-1310-jsw	38.134326	-79.626355	6/22/2016	
P-183-160621-1318-jsw	38.134258	-79.625168	6/22/2016	
P-184-160607-0950-jsw	38.111557	-79.590096	6/7/2016	
P-185-160607-1034-jsw	38.111175	-79.589628	6/7/2016	
P-185A-160607-1234-jsw	38.110747	-79.589117	6/7/2016	
P-186-160607-1245-jsw	38.110555	-79.588470	6/7/2016	
P-187-160607-1427-jsw	38.110228	-79.586822	6/7/2016	
P-188-160607-0932-sdd	38.110543	-79.586114	6/7/2016	
P-189-160607-1143-sdd	38.109860	-79.584697	6/7/2016	
P-190-160607-1315-sdd	38.109638	-79.584142	6/7/2016	
P-191-160607-1459-sdd	38.108878	-79.583731	6/7/2016	

Attachment 2
Soil Observations Inventory

Pit ID	Latitude	Longitude	Date Completed	Recon Pit ID in Proximity to Proposed Pit Location
P-192-160607-1631-sdd	38.107756	-79.581089	6/7/2016	
P-193-160607-1620-jsw	38.107313	-79.580714	6/7/2016	
P-194			ELIMINATED	
P-195-160608-1325-sdd	38.141670	-79.478032	6/8/2016	
P-196-160608-1157-sdd	38.142017	-79.477453	6/8/2016	
P-197-160608-1047-sdd	38.143185	-79.475973	6/8/2016	
P-198			ELIMINATED	
P-199-160608-0856-sdd	38.143720	-79.475219	6/8/2016	
P-200-160603-1426-sdd	38.151819	-79.470534	6/3/2016	
P-201-160603-1326-jsw	38.152239	-79.469819	6/3/2016	
P-202-160603-1339-sdd	38.153102	-79.469224	6/3/2016	
P-203-160603-1129-sdd	38.154100	-79.468563	6/3/2016	
P-204-160603-0939-sdd	38.154585	-79.467851	6/3/2016	
P-205-160603-1155-jsw	38.155379	-79.467208	6/3/2016	
P-206-160603-0930-jsw	38.156056	-79.465978	6/3/2016	
P-207-160602-1508-jsw	38.156590	-79.465207	6/2/2016	
P-208-160603-0837-sdd	38.157474	-79.464640	6/2/2016	
P-209-160602-1356-sdd	38.157961	-79.463613	6/2/2016	
P-210-160602-1332-sdd	38.158852	-79.463050	6/2/2016	
P-211-160602-1149-sdd	38.159383	-79.461849	6/2/2016	
P-212-160602-1002-sdd	38.160149	-79.461016	6/2/2016	
P-212A-160602-1109-sdd	38.160343	-79.461274	6/2/2016	
P-213-160602-1236-jsw	38.160954	-79.460202	6/2/2016	
P-214-160602-1118-jsw	38.161666	-79.459583	6/2/2016	
P-215-160602-1037-jsw	38.162148	-79.458908	6/2/2016	
P-216-160608-1140-dat	38.242245	-79.347224	6/8/2016	
P-216A-160608-1320-dat	38.241688	-79.347391	6/8/2016	
P-216B-160608-1414-dat	38.241282	-79.347673	6/8/2016	
P-217-160608-0823-dat	38.242821	-79.346816	6/8/2016	
P-218-160608-1010-dat	38.246401	-79.344657	6/8/2016	
P-219-160607-1430-dat	38.280821	-79.309080	6/7/2016	
P-220-160607-1336-dat	38.280548	-79.308365	6/7/2016	
P-221-160607-1223-dat	38.280330	-79.307704	6/7/2016	
P-222-160607-1055-dat	38.279848	-79.306398	6/7/2016	
P-223-160607-0910-dat	38.279581	-79.304450	6/7/2016	R-008, R-009, R-010, R-011
P-224-160608-1315-sdd	38.280365	-79.299385	6/8/2016	
P-225-160601-1130-mel	38.281239	-79.293194	6/1/2016	
P-225A-160601-1130-jcr	38.281018	-79.292845	6/1/2016	
P-225B-160601-1312-sdd	38.281602	-79.292648	6/1/2016	
P-226-160601-1400-dat	38.281904	-79.292469	6/1/2016	
P-227-160601-1500-jsw	38.283042	-79.291111	6/1/2016	
P-228-160610-0907-def	38.283668	-79.290732	6/10/2016	
P-229-160610-0900-def	38.283719	-79.289602	6/10/2016	
P-230				R-018
P-230A-160610-0855-def	38.283847	-79.288044	6/10/2016	

Attachment 2
Soil Observations Inventory

Pit ID	Latitude	Longitude	Date Completed	Recon Pit ID in Proximity to Proposed Pit Location
P-231-160610-1130-def	38.283993	-79.287246	6/10/2016	R-015
P-232				R-016, R-017
P-233-160607-1000-mel	38.284343	-79.284399	6/7/2016	
P-234-160607-1045-mel	38.284895	-79.283650	6/7/2016	
P-235-160607-1135-mel	38.285581	-79.282999	6/7/2016	
P-236-160607-1535-mel	38.286188	-79.282289	6/7/2016	
P-237-160607-1240-mel	38.286102	-79.281037	6/7/2016	
P-238-160607-1355-mel	38.286893	-79.279988	6/7/2016	
P-239-160607-1427-def	38.287576	-79.278765	6/7/2016	
P-239A-160607-1430-def	38.287305	-79.278585	6/7/2016	
P-240-160607-0932-def	38.287742	-79.277544	6/7/2016	
P-241-160607-0926-def	38.288566	-79.276686	6/7/2016	
P-241A-160607-0940-def	38.288418	-79.276402	6/7/2016	
P-242-160607-0920-def	38.289296	-79.275998	6/7/2016	
P-243-160607-0900-def	38.289838	-79.275148	6/7/2016	
P-244-160607-0910-def	38.290355	-79.274278	6/7/2016	
P-245-160608-0855-def	38.290801	-79.273381	6/8/2016	
P-246-160608-0900-def	38.291003	-79.272386	6/8/2016	
P-247-160608-0912-def	38.291122	-79.270842	6/8/2016	
P-248-160608-0920-def	38.290830	-79.269737	6/8/2016	
P-249-160608-0923-def	38.290328	-79.268588	6/8/2016	
P-250-160608-1320-mel	38.290641	-79.267628	6/8/2016	
P-251-160608-1230-mel	38.290178	-79.266138	6/8/2016	
P-252-160608-1452-mel	38.290651	-79.264931	6/8/2016	
P-253-160608-0950-mel	38.290721	-79.263507	6/8/2016	
P-254-160608-1050-mel	38.290133	-79.262958	6/8/2016	
P-255-160608-0850-jsw	38.289224	-79.262164	6/8/2016	
P-256-160608-0925-jsw	38.288604	-79.261690	6/8/2016	
P-257-160608-1040-jsw	38.288602	-79.260322	6/8/2016	
P-258-160608-1051-jsw	38.287831	-79.259675	6/8/2016	
P-259-160608-1305-jsw	38.287771	-79.258457	6/8/2016	
P-260-160609-0845-jsw	38.287743	-79.256761	6/9/2016	
P-261-160609-0920-jsw	38.288164	-79.255843	6/9/2016	
P-262-160609-1134-jsw	38.287642	-79.254649	6/9/2016	
P-263-160609-1334-jsw	38.288496	-79.253538	6/9/2016	
P-264-160609-1425-jsw	38.289228	-79.252679	6/9/2016	
P-265-160609-1040-mel	38.289219	-79.251504	6/9/2016	
P-266-160609-0950-mel	38.289508	-79.250368	6/9/2016	
P-267-160609-1205-mel	38.289483	-79.248929	6/9/2016	
P-268-160609-1430-mel	38.290636	-79.248170	6/9/2016	
P-269-160609-1320-mel	38.290426	-79.247004	6/9/2016	
P-270-160610-0915-mel	38.290637	-79.245661	6/10/2016	
P-271-160610-1105-mel	38.290891	-79.245104	6/10/2016	
P-272-160610-1210-mel	38.290983	-79.243830	6/10/2016	
P-273-160610-1300-mel	38.290616	-79.242804	6/10/2016	

Attachment 2
Soil Observations Inventory

Pit ID	Latitude	Longitude	Date Completed	Recon Pit ID in Proximity to Proposed Pit Location
P-274-160610-1210-jsw	38.291243	-79.241377	6/10/2016	
P-275-160610-1046-jsw	38.291315	-79.239676	6/10/2016	
P-276-160610-0838-jsw	38.291532	-79.238764	6/10/2016	
P-277-160610-0841-sdd	38.291639	-79.237981	6/10/2016	
P-278-160610-1143-sdd	38.291598	-79.236495	6/10/2016	
P-279-160610-1359-dat	38.292196	-79.234639	6/10/2016	
P-279A-160610-1450-def	38.292143	-79.234401	6/10/2016	
P-279B-160610-1249-sdd	38.291880	-79.235650	6/10/2016	
P-280-160610-1308-dat	38.291896	-79.233904	6/10/2016	
P-281-160610-1144-dat	38.291712	-79.232895	6/10/2016	
P-282-160610-0839-dat	38.291551	-79.231995	6/10/2016	
P-283-160606-0743-def	38.289434	-79.222291	6/6/2016	
P-284-160606-0748-def	38.289181	-79.221479	6/6/2016	
P-285-160606-0757-def	38.288924	-79.220230	6/6/2016	
P-286-160606-0808-def	38.288608	-79.219344	6/6/2016	
P-287-160606-0825-def	38.288695	-79.217843	6/6/2016	
P-288-160606-1433-def	38.288990	-79.216718	6/6/2016	
P-289-160606-1540-mel	38.289464	-79.215648	6/6/2016	
P-290-160606-1445-mel	38.289130	-79.214670	6/6/2016	
P-291-160606-1330-mel	38.288774	-79.213757	6/6/2016	
P-292-160606-1230-mel	38.288718	-79.212416	6/6/2016	
P-293-160606-1056-mel	38.289242	-79.211297	6/6/2016	
P-294-160606-0905-mel	38.289004	-79.209886	6/6/2016	
P-295-160603-1335-mel	38.289863	-79.209012	6/3/2016	
P-296-160603-1245-def	38.289470	-79.207684	6/3/2016	
P-297-160603-1153-mel	38.290183	-79.206863	6/3/2016	
P-298-160603-1000-def	38.290656	-79.205743	6/3/2016	
P-299-160603-0820-def	38.291060	-79.204206	6/3/2016	
P-300-160603-1123-jcr	38.291395	-79.203183	6/3/2016	
P-301-160603-1326-jcr	38.291485	-79.202405	6/3/2016	
P-302-160603-1115-mgw	38.292043	-79.201272	6/3/2016	
P-303-160603-0830-mgw	38.291839	-79.199702	6/3/2016	
P-303A-160603-0920-mgw	38.292236	-79.200343	6/3/2016	
P-304-160603-0815-mgw	38.291682	-79.198304	6/3/2016	
P-305-160602-1145-def	38.291984	-79.197999	6/2/2016	
P-306-160602-1100-mgw	38.291272	-79.196179	6/2/2016	
P-307-160602-1045-def	38.291128	-79.195313	6/2/2016	
P-308-160602-1231-jcr	38.291442	-79.194554	6/2/2016	
P-308A-160602-1343-jcr	38.291120	-79.194128	6/2/2016	
P-309-160602-1449-jcr	38.290843	-79.193369	6/2/2016	
P-310-160603-0835-jcr	38.290284	-79.191247	6/3/2016	
P-311-160602-1600-mel	38.289921	-79.190856	6/2/2016	
P-312-160602-1509-mel	38.289782	-79.190016	6/2/2016	R-012, R-014
P-313				R-013
P-314-160602-1115-mel	38.288569	-79.187940	6/2/2016	

Attachment 2
Soil Observations Inventory

Pit ID	Latitude	Longitude	Date Completed	Recon Pit ID in Proximity to Proposed Pit Location
P-315			HOLD	
P-316			HOLD	
P-317			HOLD	R-004, R-005
P-318			HOLD	
P-319			HOLD	
P-320			HOLD	R-006
P-321			HOLD	
P-322			HOLD	
P-323			HOLD	R-001, R-002, R-003
P-324			HOLD	
P-325			HOLD	
P-326			HOLD	
P-327			HOLD	
P-328			HOLD	
P-329			HOLD	
P-330			HOLD	
P-331			HOLD	R-007
P-332			HOLD	
P-333-160621-1327-jsw	38.134099	-79.624202	6/21/2016	
P-334-160622-1115-rl	38.133787	-79.600482	6/22/2016	
P-335-160622-1110-rl	38.133387	-79.600439	6/22/2016	
P-336-160622-1100-rl	38.132649	-79.600029	6/22/2016	
P-337-160622-1055-rl	38.131961	-79.599479	6/22/2016	
P-338-160622-1045-rl	38.130824	-79.599429	6/22/2016	
P-339-160622-1035-rl	38.130144	-79.598737	6/22/2016	
P-340-160622-1600-mgw	38.129192	-79.598785	6/22/2016	
P-341-160622-1525-def	38.128289	-79.598359	6/22/2016	
P-342-160622-1040-mgw	38.127330	-79.598883	6/22/2016	
P-343-160622-1130-mgw	38.126220	-79.599181	6/22/2016	
P-344-160622-1030-mgw	38.125401	-79.598632	6/22/2016	
P-345-160622-1025-mgw	38.124390	-79.597855	6/22/2016	
P-346-160622-1020-mgw	38.123980	-79.597409	6/22/2016	
P-347-160621-1409-def	38.122945	-79.596885	6/21/2016	
P-348-160621-1115-mgw	38.122555	-79.596105	6/21/2016	
P-349-160621-1215-mgw	38.121246	-79.596789	6/21/2016	
P-350-160621-1205-def	38.120324	-79.597078	6/21/2016	
P-351-160621-1140-def	38.119285	-79.597009	6/21/2016	
P-352-160621-1145-def	38.118626	-79.597265	6/22/2016	
P-352A-160621-1147-mgw	38.118600	-79.597471	6/21/2016	
P-353-160622-1050-def	38.117620	-79.598270	6/22/2016	
P-353A-160622-1035-def	38.116438	-79.597667	6/22/2016	
T-007A-160620-1420-dat	38.351790	-80.039307	6/20/2016	
T-007B-160620-1418-dat	38.351932	-80.039434	6/20/2016	
T-025A-160614-1455-jsw	38.306534	-79.880420	6/14/2016	
T-027A-160617-1116-jcr	38.304648	-79.877692	6/17/2016	

Attachment 2
Soil Observations Inventory

Pit ID	Latitude	Longitude	Date Completed	Recon Pit ID in Proximity to Proposed Pit Location
T-029A-160617-1219-jcr	38.303475	-79.876365	6/17/2016	
T-042A-160614-1441-jcr	38.302438	-79.855259	6/14/2016	
T-045A-160614-1201-jcr	38.302165	-79.853619	6/14/2016	
T-047A-160614-1555-def	38.301663	-79.849385	6/14/2016	
T-049A-160614-1410-def	38.301708	-79.847471	6/14/2016	
T-049B-160614-1420-def	38.301847	-79.847588	6/14/2016	
T-055A-160613-1115-rll	38.299785	-79.840669	6/13/2016	
T-067A-160614-1552-sdd	38.296812	-79.828580	6/14/2016	
T-071A-160614-1618-sdd	38.299288	-79.825090	6/14/2016	
T-073A-160616-1645-sdd	38.301188	-79.823528	6/16/2016	
T-075A-160616-1614-sdd	38.302380	-79.822906	6/16/2016	
T-076A-160616-1628-sdd	38.302653	-79.822890	6/16/2016	
T-079A-160617-1341-sdd	38.304856	-79.819850	6/17/2016	
T-093A-160609-1556-sdd	38.303851	-79.806609	6/9/2016	
T-103A-160613-1328-jsw	38.302138	-79.795361	6/13/2016	
T-103B-160613-1329-jsw	38.302055	-79.795382	6/13/2016	
T-112A-160613-1645-jcr	38.301960	-79.785899	6/13/2016	
T-114A-160613-1427-jcr	38.302996	-79.783457	6/13/2016	
T-121A-160616-1200-mgw	38.305766	-79.774953	6/16/2016	
T-135A-160615-1341-sdd	38.303013	-79.762053	6/15/2016	
T-151A-160606-1157-sdd	38.183901	-79.679547	6/6/2016	
T-157A-160606-1711-dat	38.179644	-79.675105	6/6/2016	
T-187A-160607-1436-jsw	38.110206	-79.588161	6/7/2016	
T-189A-160607-1112-sdd	38.110365	-79.584878	6/7/2016	
T-191B-160607-1533-sdd	38.108956	-79.583938	6/7/2016	
T-191A-160607-1611-sdd	38.108844	-79.583182	6/7/2016	
T-203A-160603-1137-sdd	38.154003	-79.468482	6/3/2016	
T-226A-160601-1419-sdd	38.282124	-79.292246	6/1/2016	
T-226B-160601-1445-sdd	38.282625	-79.291802	6/1/2016	
T-238A-160607-1505-mel	38.287227	-79.279211	6/7/2016	
T-239A-160607-1650-def	38.287205	-79.278339	6/7/2016	
T-247A-160608-1347-def	38.291108	-79.271139	6/8/2016	
T-247B-160608-1358-def	38.290970	-79.270993	6/8/2016	
T-247C-160608-1404-def	38.291003	-79.270921	6/8/2016	
T-250A-160608-1426-mel	38.290991	-79.267244	6/8/2016	
T-253A-160608-1150-mel	38.290995	-79.264193	6/8/2016	
T-256A-160608-0945-jsw	38.288497	-79.261770	6/8/2016	
T-258A-160608-1257-jsw	38.288307	-79.259385	6/8/2016	
T-266A-160609-1525-mel	38.289297	-79.250405	6/9/2016	
T-269A-160609-1405-mel	38.290380	-79.247260	6/9/2016	
T-277A-160610-1106-sdd	38.291589	-79.237381	6/10/2016	
T-283A-160606-1358-def	38.289400	-79.222592	6/6/2016	
T-285A-160606-1233-def	38.288563	-79.221072	6/6/2016	
T-291A-160606-1625-mel	38.288597	-79.213567	6/6/2016	
T-291B-160606-1636-mel	38.289028	-79.214161	6/6/2016	

Attachment 2
Soil Observations Inventory

Pit ID	Latitude	Longitude	Date Completed	Recon Pit ID in Proximity to Proposed Pit Location
T-293A-160606-1037-mel	38.288973	-79.210733	6/6/2016	
T-293B-160606-1122-mel	38.289153	-79.211634	6/6/2016	
T-296A-160606-0849-mel	38.289613	-79.207417	6/6/2016	
T-299A-160603-1040-mel	38.290746	-79.204736	6/3/2016	
T-301A-160603-1350-mgw	38.291223	-79.202085	6/3/2016	
T-307A-160602-1430-mgw	38.291279	-79.195668	6/2/2016	
T-309B-160602-1125-jcr	38.290835	-79.192989	6/2/2016	
T-309A-160602-1125-jcr	38.291262	-79.193677	6/2/2016	
T-310A-160602-1532-jcr	38.290482	-79.193216	6/2/2016	
T-310C-160603-0938-jcr	38.290244	-79.192000	6/3/2016	
T-310B-160603-0937-jcr	38.290259	-79.192630	6/3/2016	
T-311A-160603-0837-mel	38.289849	-79.190920	6/3/2016	
T-311B-160603-0857-mel	38.289825	-79.190578	6/3/2016	
T-312A-160602-1412-mel	38.289085	-79.189597	6/2/2016	
T-345A-160622-1420-mgw	38.124758	-79.597462	6/22/2016	
T-353A-160622-1057-def	38.118251	-79.597487	6/22/2016	

Attachment 3
Reconnaissance Soil Test Pit Logs

TEST PIT DESCRIPTION

Soil Scientist: Dan Fenstermaker Signature: Barry Fenstermaker
 Field Assistant: Mike Callahan, Dr. Galbraith, Steve Carpenter, Charles

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID: R-160509-1000-MC-1 R-001-160509-1000-MPC
 Date: 5/9/16
 Job Name: Dominion - Atlantic Coast Pipeline Soil Survey
 RETTEW Job #: 089962000
 NRCS Soil Unit: Leu2 (59E)
 Soil Series: Leu bouldery silt loam, 10-45% slopes
 USDA
 Topographic Position: Shoulder nose slope
 % Slope / Aspect: 14:1
 Drainage Class: Wall
 Depth to Refusal: 50"
 Bedrock Type and Dip Slope: N/A
 Mineralogy: Mixed

Horizon	Depth in Inches	Matrix Color	Rock Fragment Type and %	Rock Fragment Size (inches)	Texture Class	% sand	% clay	Plasticity / Stickiness	Structure Type, Grade, and Size	Moist Consistence	Horizon Boundary Topography and Distinctness	Redox Feature Color	Redox Feature Description	Lab Sample ID
A	0-1.5	7.5YR 2.5/1	-	-	sil	17	10	PS 90	1vF sht	Vfr	CW	-	-	few sun layer stones
BE	1.5-7.5	10YR 5/3	-	-	sil	11	10	PS 50	1f sht	R	C/W	-	-	
Bt1	7.5-15	10YR 6/4	9r 8%	2.10	sil	12	14	PS 50	2f sht	fr	C/S	-	-	
								PS 50	2m sht					
Bt2	15-26	10YR 6/4	9r 20%	0.5-2.0	sil	10	18	PS 50	2m sht	fr	C/W	-	-	
								PS 50	1co sht					
BC	26-36	10YR 5/4	9r 40%	0.5-2.0	sil	10	12	PS 50	1co sht	fr	C/S	-	-	
								PS 50	1co sht					
Cr	36-50+	2.5Y 6/1	cdk Hard 40%	0.5-2.0	si	5	10	PS 50	RDF	fr	-	-	-	
								PS 50	RDF					

10YR 5/8
 Not observed
 Thin Cr/Oe present varying thickness

Water Table? Y/N Description: _____
 Indications of slips or slope failures? Y/N Description: _____
 Special Features? Y/N Description: _____
 Dominant Vegetation: ① Chestnut oak, sourwood, ② black oak, chestnut, Red maple, Blueberry, Rhododendron
 Other Notes: Minerogenic colors, palyday 0

Clay
 Fines

TEST PIT DESCRIPTION

Soil Scientist: John Wah
Field Assistant: Dr. John Galbraith, Mike Callahan

Signature: *[Handwritten Signature]*

[Handwritten Signature]

RETTEW Associates, Inc.
3020 Columbia Avenue
Lancaster, PA 17603
Phone: 717-394-3721
Fax: 717-394-1063

Test Pit ID: ~~R-160509-1015-2~~ R-002-160509-1015-MPC
 Date: 5/9/14
 Job Name: Dominion - Atlantic Coast Pipeline Soil Survey
 RETTEW Job #: 089962000
 NRCS Soil Unit: ~~140~~ (S9E)
 Soil Series: Low bouldery silt loam, 10-45% slopes
 Topographic Position: F/S
 % Slope / Aspect: 49% - SWP
 Drainage Class: -
 Depth to Refusal: -
 Bedrock Type and Dip Slope: -
 Mineralogy: Mixed
 USDA: -
 Redox Feature Color: -
 Redox Feature Description: -
 Lab Sample ID: -

Horizon	Depth in Inches	Matrix Color	Rock Fragment Type and %	Rock Fragment Size (inches)	Texture Class	% sand	% clay	Plasticity / Stickiness	Structure Type, Grade, and Size	Moist Consistence	Horizon Boundary Topography and Distinctness	Redox Feature Color	Redox Feature Description	Lab Sample ID
Di	0-2.0	5YR 2.5/2	ch 10%	1"	2	45	13	2	2M	FR	CS	-	-	
A	2.0-4.0	10YR 3/2	ch 10%	1"	2	45	13	2	2FSBK	FR	CS	-	-	
BE1	4.0-12.0	10YR 4/6	ch 10%	1"	2	35	14	2	2MSBK	FR	CS	-	-	
BE2	12.0-20.0	7.5YR 4/6	ch 10%	2"	L	45	18	SS	2MSBK	FR	CS	-	-	
2Bk3	20.0-50+	7.5YR 4/6	ch 10%	3-5" < .05"	L	45	18	SS SP	1MSBK	FR	-	2MSBK	2ZF	

Bedrock Notes: VF SS, silt, or loess
 Water Table? N Description: flowing in at 2.2"
 Indications of slips or slope failures? N Description:
 Special Features? N Description:
 Dominant Vegetation: Mixed deciduous - oak, sassafras, red maple, sycamore, hickory, tulip, poplar
 Other Notes: surface channels 6"

[Handwritten Notes]
 200, 29, m =

TEST PIT DESCRIPTION

Soil Scientist: Dan Fenstermaker Signature: David Fenstermaker
 Field Assistant: John Galbraith Steve Carpenter, Charles

Shebets?

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID: ~~R-1100509-1030-3~~ R-003-160509-1030-MPC
 Date: 5/1/16
 Job Name: Dominion - Atlantic Coast Pipeline Soil Survey
 RETTEW Job #: 089962000
 NRCS Soil Unit: Lew (59E)
 Soil Series: Lew bouldery silt loam, 10-45% slopes
 USDA
 Topographic Position: Footslope
 % Slope / Aspect: 15% North
 Drainage Class: Medwell
 Depth to Refusal:
 Bedrock Type and Dip Slope:
 Mineralogy: Mixed

Horizon	Depth in Inches	Matrix Color	Rock Fragment Type and %	Rock Fragment Size (Inches)	Texture Class	% sand	% clay	Plasticity / Stickiness	Structure Type, Grade, and Size	Moist Consistence	Horizon Boundary Topography and Distinctness	Redox Feature Color	Redox Feature Description	Lab Sample ID
A	0-2	7.5R 2.511	—	—	SL	30	12	—	1W5aK	Fc	CW	N		Few sun fired cobbles
AE	0-3.5	10.4R 4H	L10.1 qH	L1"	S.L	30	12	NF	1F5aK	Fc	BCI	N		
Bt1	3.5-9	10.1R 519	L10.1 qr	L1"	SL	30	20	SP	2F5aK	Fc	CS	N		
Bt2	9-26	10.4R 514	L10.1 qH	L1"	S.L	25	23	SP	2M5bK	Fc	CS	N		very moist
Bt3	26-35	10.1R 514	L10.1 qr	L1"	S.L	33	25	SP	2M5bK	Fc	CS	N		Kendall Co clay plus
Bt4	35-50+	15.1R 514	L10.1 qr	L1"	S.L	10	26	SP	2M5bK	Fc	—			Redmond and oak leaf clay plus

Bedrock Notes: Not observed thin gilde present - varying thickness

Water Table? Y/N Description: 45" seeped in at depth and starts @ 34"

Indications of slips or slope failures? Y/N Description: Colluvium

Special Features? Y/N Description: Black Oak, Scarlet Oak, Red maple, Blueberry, sassafras, waterberry
 Dominant Vegetation: Black Oak, Scarlet Oak, Red maple, Blueberry, sassafras, waterberry
 Other Notes: Some American Chestnut saplings starting

TEST PIT DESCRIPTION

Soil Scientist: John Wah
 Field Assistant: Charles Delp, Stephen Carpenter

Signature: *[Handwritten Signature]*

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID: ~~R-160509-0115-MPC-4~~ R-004-160509-0115-MPC

Date: 7/17/16

Job Name: Dominion - Atlantic Coast Pipeline Soil Survey

RETTEW Job #: 089962000

NRCS Soil Unit: Monongahela (62C)

Soil Series: ~~Monongahela~~ Monongahela fine sandy loam, 7-15% slopes

USDA

Mineralogy: ~~Monongahela~~

Bedrock Type and Dip Slope: ~~Monongahela~~

Topographic Position: ~~Monongahela~~

% Slope / Aspect: ~~Monongahela~~

Drainage Class: ~~Monongahela~~

Depth to Refusal: ~~Monongahela~~

Horizon Boundary Topography and Distinctness: ~~Monongahela~~

Moist Consistence: ~~Monongahela~~

Structure Type, Grade, and Size: ~~Monongahela~~

Plasticity / Stickiness: ~~Monongahela~~

% clay: ~~Monongahela~~

% sand: ~~Monongahela~~

Texture Class: ~~Monongahela~~

Rock Fragment Size (inches): ~~Monongahela~~

Rock Fragment Type and %: ~~Monongahela~~

Matrix Color: ~~Monongahela~~

Depth in Inches: ~~Monongahela~~

Horizon: ~~Monongahela~~

Horizon	Depth in Inches	Matrix Color	Rock Fragment Type and %	Rock Fragment Size (inches)	Texture Class	% sand	% clay	Plasticity / Stickiness	Structure Type, Grade, and Size	Moist Consistence	Horizon Boundary Topography and Distinctness	Redox Feature Color	Redox Feature Description	Lab Sample ID
Di	0-1.5	5YR 3/1	-	-	-	-	-	-	-	-	-	-	-	-
A	1.5-3	10YR 3/2	2% 2-20	2-20	SL	35	10	P ₀ 30 S ₀ 30	2FQR	FR	cs	-	-	-
B ₁	3-10	10YR 6/6	2% 2-20	<0.25	L	45	12	P ₀ 30 S ₀ 30	2MSBK	FR	cs	-	-	-
B ₂	10-15	2.5YR 6/6	20% 2-20	0.75	L	45	15	P ₀ 30 S ₀ 30	100BK	FR	cs	-	-	-
B ₃	15-20	5YR 5/6	40% 2-20	2	LR	45	17	P ₀ 30 S ₀ 30	100SK 100PL	FR	cs	-	-	-
B ₄	20-25	5YR 5/6	40% 2-20	2	LR	45	17	P ₀ 30 S ₀ 30	FR (many) PL	FR	-	-	-	-

Bedrock Notes: sand, ripple, concave over region

Water Table? Y/N Description: ~~Monongahela~~

Indications of slips or slope failures? Y/N Description: ~~Monongahela~~

Special Features? Y/N Description: ~~Monongahela~~

Dominant Vegetation: ~~Monongahela~~

Other Notes: sand, clay, silt

[Handwritten notes in margin]
 TR
 20.5% silt
 20.5% clay
 59% sand
 20.5% silt
 20.5% clay
 59% sand

TEST PIT DESCRIPTION

Soil Scientist: Don Fensholt

Signature: [Signature]

[Signature]

RETTEW Associates, Inc.
3020 Columbia Avenue
Langhorne, PA 17603
Phone: 717-394-3721
Fax: 717-394-1063

Field Assistant:

Test Pit ID: A-16-0509-1325-5-MPC R-005-160509-1325-MPC
 Date: 5/9/16
 Job Name: Dominion - Atlantic Coast Pipeline Soil Survey
 RETTEW Job #: 089962000
 NRCS Soil Unit: Calataha (16E)
 Soil Series: Cataaska channelly silt loam, 15-45% slopes

Horizon	Depth in Inches	Matrix Color	Rock Fragment Type and %	Rock Fragment Size (inches)	Texture Class	% sand	% clay	Plasticity / Stickiness	Structure Type, Grade, and Size	Moist Consistence	Horizon Boundary Topography and Distinctness	Redox Feature Color	Redox Feature Description	Lab Sample ID
A	0-1	10YR 6/3	30% g	< 1/8"	Silt	40	12	NP	1W5BK	FR	CW			
BE	1-8	10YR 6/3	30% g	< 1/8"	Silt	30	14	NS	1F5BK	FR	CS			
BE	8-17	10YR 6/4	30% CH	1/2-1"	Silt	30	15	SP NS	1M5BK	FR	CS			
BE	17-29	7.5YR 5/4	40% CH	1/2-2"	Silt	30	16	SP NS	1G5BK	FR	CS			
BE	29-38	7.5YR 5/4	5% CH	1/8-2"	Silt	30	16	SP NS	1K5BK	FR	CS			
BE	38-50+	10YR 6/4	30% CH	1/8-2"	L	38	12	NP NS	PM defined	FR	-			

Bedrock Notes: Not observed Thin O/A present

Water Table? Y/N Description: _____
 Indications of slips or slope failures? Y/N Description: _____
 Special Features? Y/N Description: Cambric - Parallel
 Dominant Vegetation: Chestnut oak - (Dom - Redwood) (S) Saw wood red maple, Blue oak, White oak
 Other Notes: Structurally black gum

TEST PIT DESCRIPTION

Soil Scientist: Mike Callahan

Signature: Sam Callahan

RETTEW Associates, Inc.
3020 Columbia Avenue
Lancaster, PA 17603
Phone: 717-394-3721
Fax: 717-394-1063

Test Pit ID: R-160509-1440-MPC R-006-160509-1440-MPC

Date: 5/9/16 Topographic Position: B/S

Job Name: Dominion - Atlantic Coast Pipeline Soil Survey % Slope / Aspect: 9 SW

RETTEW Job #: 089962000 Drainage Class: W

NRCS Soil Unit: Hartleton (48E) Depth to Refusal: -

Soil Series: Hartleton channery loam, 15-45% slopes Bedrock Type and Dip Slope: -

USDA Mineralogy: Mixed

Horizon	Depth in Inches	Matrix Color	Rock Fragment Type and %	Rock Fragment Size (inches)	Texture Class	% sand	% clay	Plasticity / Stickiness	Structure Type, Grade, and Size	Moist Consistence	Horizon Boundary Topography and Distinctness	Redox Feature Color	Redox Feature Description	Lab Sample ID
D: 0-2	0-2	gray	-	-	-	-	-	-	-	-	-	-	-	
D: 2-3.5	2-3.5	light gray	2	<0.5	sl	35	12	PO SO	1F50K	RR	as	-	-	
D: 3.5-14	3.5-14	gray	2	<0.5	sl	35	14	PO SO	2m50K	RR	es	-	-	
D: 14-21	14-21	light gray	5	<0.75	sl	33	14	PO SO	2m50K	RR	es	-	-	
D: 21-30	21-30	gray	10	1.2	L	40	22	SP SO	1m50K	RR	cm	-	-	
D: 30-50	30-50	gray	10	1.5	CL	10	32	SP SO	2m50K	F-1	-	-	-	

Bedrock/Notes: Spand over, conversion over conversion

Water Table? Y/N Description: _____

Indications of slips or slope failures? Y/N Description: _____

Special Features? Y/N Description: _____

Dominant Vegetation: oak / chestnut oak / scarlet oak / red maple / sourwood / sassafras / low bush blueberry

Other Notes: DEF PAN

TEST PIT DESCRIPTION

Soil Scientist: Mike Colbran

Signature: [Signature]

Field Assistant:

RETTEW Associates, Inc.
3020 Columbia Avenue
Lancaster, PA 17603
Phone: 717-394-3721
Fax: 717-394-1063

Test Pit ID: R-160509-1550-MPC-7 R-007-160509-1550-MPC
 Date: 5/9/16
 Job Name: Dominion - Atlantic Coast Pipeline Soil Survey
 RETTEW Job #: 089962000
 NRCS Soil Unit: LWV (59E)
 Soil Series: Lew bouldery silt loam, 10-45% slopes

USDA

Topographic Position: F/S
 % Slope / Aspect: 5 W
 Drainage Class: Poorly Drained
 Depth to Refusal: 20"
 Bedrock Type and Dip Slope:
 Mineralogy: Mixed

Horizon	Depth in Inches	Matrix Color	Rock Fragment Type and %	Rock Fragment Size (inches)	Texture Class	% sand	% clay	Plasticity / Stickiness	Structure Type, Grade, and Size	Moist Consistence	Horizon Boundary Topography and Distinctness	Redox Feature Color	Redox Feature Description	Lab Sample ID
0i	0-5	10YR 2.5/1									a/s			
A	0.5-3	10YR 3/2	veh ss	1-5	sil	26	18	P0 S0	1P sbk	fr	c/s			
BA	3-4	10YR 4/1	veh ss	1-5	sil	26	18	P0 S0	1P sbk	fr	a/wi			
Bt	7-12	10YR 5/1	veh ss	1-5	l	35	25	P5 MS	2m sbk	fr	-			
wsh	12+													

Bedrock Notes:

BLX found in adjacent stream; likely underneath water in this pit causing perching.

Water Table?

Y/N Description: water at 17" wet seep 30' down slope

Indications of slips or slope failures?

Y/N Description: up slope over slide onto area of investigation.

Special Features?

Y/N Description: seep 30' down slope.

Dominant Vegetation:

oaks / hickory / northern red oak / white oak / dogwood / sourwood / ~~red maple~~ / magnolia

Other Notes:

might be result of upslope slip - large boulders and rock flows
water @ 12" seeping from 9" surface stone 40%

TEST PIT DESCRIPTION

Soil Scientist: Sohn Wal

Signature: David S. Suter

Field Assistant: D. Spence
Schnegelsberg

RETTEW Associates, Inc.
3020 Columbia Avenue
Lancaster, PA 17603
Phone: 717-394-3721
Fax: 717-394-1063

Test Pit ID: ~~R-160510-0905-MPC-8~~ R-008-160510-0905-MPC

Date: ~~5/10/16~~

Job Name: Dominion - Atlantic Coast Pipeline Soil Survey

RETTEW Job #: 0839962000

NRCS Soil Unit: Berks (8D)

Soil Series: Berks channery silt loam, 7-25% slopes

USDA

Horizon	Depth in Inches	Matrix Color	Rock Fragment Type and %	Rock Fragment Size (inches)	Texture Class	% sand	% clay	Plasticity / Stickiness	Structure Type, Grade, and Size	Moist Consistence	Horizon Boundary Topography and Distinctness	Redox Feature Color	Redox Feature Description	Lab Sample ID
G1	0-2	5YR5/1	—	—	—	—	—	—	2Mbr	fr	A-U	N	N	
A	2-5	10YR7/2	20% G1	1/2"	Sil	15	10	PO SD	1M5br	fr	AS	N	N	
Bw1	5-9.5	10YR5/4	5% CH	1/2-3"	Sil	20	14	PO SD	1M5br	fr	CS	N	N	
Bw2	9.5-18.5	10YR5/4	8% CH	3"-4"	S.L	20	14	PO SO	1M5br	fr	AW	N	N	
R	18.5+	—	—	—	—	—	—	—	—	—	—	—	—	

Shale - sloping down to North

Bedrock Notes: Shale - sloping down to North

Water Table? Y/N Description: _____

Indications of slips or slope failures? Y/N Description: _____

Special Features? Y/N Description: Compic

Dominant Vegetation: chestnut oak, Virginia pine, white pine, sweet gum, blueberry

Other Notes: White pine

TEST PIT DESCRIPTION

Soil Scientist: John W. Smith
 Field Assistant: D. L. ...

Signature: David J. ...

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Over the road
rock layer

well sorted

Test Pit ID: R-009-160510-0915-MPC
 Date: 5/11/10
 Job Name: Dominion - Atlantic Coast Pipeline Soil Survey
 RETTEW Job #: 089962000
 NRCS Soil Unit: Berks (8D)
 Soil Series: Berks channelly silt loam, 7-25% slopes

Horizon	Depth in Inches	Matrix Color	Rock Fragment Type and %	Rock Fragment Size (inches)	Texture Class	% sand	% clay	Plasticity / Stickiness	Structure Type, Grade, and Size	Moist Consistence	Horizon Boundary Topography and Distinctness	Redox Feature Color	Redox Feature Description	Lab Sample ID
A	11.5-12.5	10YR 5/6	25% CH	1/2"	L	45	10	PO	1C4M	F1	AMB			
B ₁	12.5-14.5	10YR 5/6	25% CH	1-3"	SIL	15	15	SP	1M4M	F1	CW			
B ₂	14.5-16.5	10YR 5/6	25% CH	1-3"	L	45	10	PO	1M4M	F1	CW			
C ₁	16.5-18.5	10YR 5/6	25% CH	5-8"	-	-	-	PO	2M	F1	CW			
C ₂	18.5-20.5	10YR 5/6	25% CH	5-8"	-	-	-	PO	2M	F1	CW			

Bedrock Notes: more level bedded than R2B

Water Table? Y/N Description: _____

Indications of slips or slope failures? Y/N Description: _____

Special Features? Y/N Description: CONCRETE

Dominant Vegetation: Overgrown grass, some oak, yellow pine, blueberry

Other Notes: _____

TEST PIT DESCRIPTION

Soil Scientist: John Wain

Signature: [Signature]

RETTEW Associates, Inc.
3020 Columbia Avenue
Lancaster, PA 17603
Phone: 717-394-3721
Fax: 717-394-1063

Test Pit ID: ~~R-160510-0925~~ 160510-0925-B R-010-160510-0925-MPC

Date: 5/10/16 Topographic Position: B/S 19 300'

Job Name: Dominion - Atlantic Coast Pipeline Soil Survey Drainage Class: Well Drained

RETTEW Job #: 089962000 Depth to Refusal: N/A

NRCS Soil Unit: Berks (8D) Bedrock Type and Dip Slope: N/A

Soil Series: Berks channery silt loam, 7-25% slopes Mineralogy: Mixed

Horizon	Depth in Inches	Matrix Color	Rock Fragment Type and %	Rock Fragment Size (inches)	Texture Class	% sand	% clay	Plasticity / Stickiness	Structure Type, Grade, and Size	Moist Consistence	Horizon Boundary Topography and Distinctness	Redox Feature Color	Redox Feature Description	Lab Sample ID
0e	0-2	5YR 2.5/1								vr				
A	2-3.5	10YR 2/2	9' 5	0.25-0.5	1	45	8	Pu su	1' gr	fr	o/s			
Be	3.5-19.5	10YR 2/2	9' 8	0.25-0.5	1	40	12	so	1' sbl	fr	c/w			
Bt	13.5-30	10YR 5/1	9' 20	0.25-0.5	2	35	18	ps ss	2' m sbl	fr	c/w			FW Disc CUEY KMS
Bc1	30-42	10YR 5/6	9' 55	0.25-0.5	1	45	13	so	1' m sbl	fr	c/w			
Bc2	42-50+	10YR 5/6	9' 65	0.25-0.5	1	42	10	so	1' p sbl	fr				

Bedrock Notes: Calcutta

Water Table? Y/N Description: _____

Indications of slips or slope failures? Y/N Description: _____

Special Features? Y/N Description: white pine / scarlet oak / maple

Dominant Vegetation: _____

Other Notes: Many fine medium roots.

roots.
many fine medium fine
common fine medium
fine fine

TEST PIT DESCRIPTION

Soil Scientist: **DEF**

Field Assistant: *John Galbraith*

Signature: *Barndt Swartzman*

Cellulium?

RETTEW Associates, Inc.
3020 Columbia Avenue
Lancaster, PA 17603
Phone: 717-394-3721
Fax: 717-394-1063

Test Pit ID: ~~R-160510-0935~~ **MC 11** R-011-160510-0935-MPC
 Date: **5/10/16**
 Job Name: **Dominion - Atlantic Coast Pipeline Soil Survey**
 RETTEW Job #: **089962000**
 NRCS Soil Unit: **Berks (8E)**
 Soil Series: **Berks channery silt loam, 25-45% slopes**

Horizon	Depth in Inches	Matrix Color	Rock Fragment Type and %	Rock Fragment Size (Inches)	Texture Class	% sand	% clay	Plasticity / Stickiness	Structure Type, Grade, and Size	Moist Consistence	Horizon Boundary Topography and Distinctness	Redox Feature Color	Redox Feature Description	Lab Sample ID
0a	0-1	7.5YR 2.5/1	-	-	-	-	-	NP NS	1M_gr	YR	Aw			Lab Sample ID 20073
A	1-4	10YR 3/2	10% CH	< 1/8"	SiL	10	10	SB SS	Mod₁z g₁r	Vfr	Cs			M-F, M_f
BE	4-8	10R 5/3	15% CH	< 3/4"	SiL	10	15	SP SS	mod₁z sbk	fr	Cw			C-F, M
2Bt1	8-10	7.5YR 5/10	45% CH	< 1/4"	L	30	24	SP SS	2msbr	fr	Cw			C-F, M
2Bt2	10-20	5YR 5/14	45% CH	< 1/2"	CL	22	28	SP SS	2msbr	fr	Cw			F-C
2Bt3	20-38	5YR 5/10	55% CH	< 1/4"	CL	22	30	SP SS	2c5br	fr	Cw			-
2Bc	38-50+	9YR 4/6	75% CH < 1/2"	< 1/8"	SL	20	20	NP NS	1c5br	fr	-			-

Bedrock Notes: **None encountered - siltstone/shale derived**

Water Table? **Y/N** Description: _____

Indications of slips or slope failures? **Y/N** Description: _____

Special Features? **Y/N** Description: **Argillie**

Dominant Vegetation: **White oak, white Ash, white pine, Dogwood** **no undergrowth**

Other Notes: **linear Rockstone Below Pit 9**

TEST PIT DESCRIPTION

Soil Scientist: D. Fenstermaker Signature: Barwill Fenstermaker
 Field Assistant: John G. Lewis, Charles, Steve,
Sam Wok

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID: R-160510-1445 ~~1445~~ AWZ 12 R-012-160510-1445-MPC
 Date: 5/10/16
 Job Name: Dominion - Atlantic Coast Pipeline Soil Survey
 RETTEW Job #: 089962000
 NRCS Soil Unit: Hazleton (51F)
 Soil Series: Hazleton soils, 25-70% slopes
 USDA

Horizon	Depth in inches	Matrix Color	Rock Fragment Type and %	Rock Fragment Size (inches)	Texture Class	% sand	% clay	Plasticity / stickiness	Structure Type, Grade, and Size	Moist Consistence	Horizon Boundary Topography and Distinctness	Redox Feature Color	Redox Feature Description	Lab Sample ID
Oe	0-1	7.5YR 2.5/1	few surface boulders	1/2" - 1/4"	L	35	12	SP	1MGR	F-r	AW	N		many fine roots
A	1-2.5	10YR 6/2	5% 9%	1/2"	L	35	12	SP	1FSAK	F-r	AW	N		many fine roots
E	2.5-12	10YR 6/1	20% 5%	1/2"	S.L	18	15	SP	1M5AK	F-r	AW	N		many fine roots
Bx	12-28	7.5YR 5/6	40% 5%	1/2-2"	CL	24	29	SP	2MSAK	F-r	CS	N		Clay like 5% in on base
Bx2	28-29	7.5YR 5/4	50% 5%	1/2-2"	CL	30	28	SP	2L5AK	F-r	CS	N		many fine roots
Bx3	29-30	7.5YR 5/4	50% 5%	1/2-2"	L	40	20		2L5AK	F-r	CS	N		many fine roots

Bedrock Notes: Not observed - refusal on Boulder - Not remarkable to dig around

Water Table? Y/N Description: 5 ft some seepage in pits

Indications of slips or slope failures? Y/N Description: down not quite erodic layers in pits

Special Features? Y/N Description: Black gum, white oak, Red oak

Dominant Vegetation: Red Maple

Other Notes: 1

TEST PIT DESCRIPTION

Soil Scientist: D. Ferguson Signature: David Ferguson
 Field Assistant: Sohn Galbraith
Chert + shale

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID: ~~R-160510-1505-MPC-13~~ R-013-160510-1505-MPC
 Date: 5/10/14
 Job Name: Dominion - Atlantic Coast Pipeline Soil Survey
 RETTEW Job #: 089962000
 NRCS Soil Unit: Hazleton (51F)
 Soil Series: Hazleton soils, 25-70% slopes

Horizon	Depth in inches	Matrix Color	Rock Fragment Type and %	Rock Fragment Size (inches)	Texture Class	% sand	% clay	Plasticity / Stickiness	Structure Type, Grade, and Size	Moist Consistence	Horizon Boundary Topography and Distinctness	Redox Feature Color	Redox Feature Description	Lab Sample ID
O ₁	0-2	Red 2.5/1	few stands	rocks	L	40	14	N ₅ NP	dfgr	VF	AW	N		CM + Coarse M + UF
A	0-2	10R 2/2	10 ¹ gr	15"	L	40	14	N ₅ NP	dfgr	VF	AW	N		
A ₁ E	2-6	10R2/1/5	20 ¹ gr	<1"	S.L	15	15	SP SP	1MSBK	VF	CW	N		Few mac Common + UF
B ₁ E	6-11.75	10R2/4	10 ¹ gr	<2"	S.L	15	20	SS SP	2MSBK	Fr	CW	N		Common med + coarse Few FUF
B ₁ t	11.75-20.5	10R2/5	10 ¹ gr	<2"	S.L	20	25	M ₅ MP	2MSBK	Fi	AW	N		Few mac Few FUF Cley 2/1ms
R	20.5-40	-	Soft shale - no fines	high fractures	high carbon shale	20	25							
R	40-44"		more	competent shale										

Bedrock Notes: Shale sloping opposite to slope
 Water Table? Y/N Description: Bedrock plane

Indications of slips or slope failures? Y/N Description: Appears to be top of cut of an old slide
 Special Features? Y/N Description: Poroliths lithol
 Dominant Vegetation: chestnut oak, tulip poplar, red maple, American chestnut saplings
 Other Notes: colluvium in regidum

TEST PIT DESCRIPTION

Soil Scientist: Mike Callahan
Field Assistant: John Warr

Signature:



RETTEW Associates, Inc.
3020 Columbia Avenue
Lancaster, PA 17603
Phone: 717-394-3721
Fax: 717-394-1063

Test Pit ID:	R-160510-1530-MPC 5/10/16 MPC 14 R-014-160510-1530-MPC	Topographic Position:	F/S
Date:	5/10/16	% Slope / Aspect:	21
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey	Drainage Class:	Poorly drained
RETTEW Job #:	089962000	Depth to Refusal:	16" --Water Table
NRCS Soil Unit:	Udorthents, bouldery (85)	Bedrock Type and Dip Slope:	N/A
Soil Series:	Udorthents, bouldery	Mineralogy:	Mixed

Horizon	Depth in Inches	Matrix Color	Rock Fragment Type and %	Rock Fragment Size (inches)	Texture Class	% sand	% clay	Plasticity / Stickiness	Structure Type, Grade, and Size	Moist Consistence	Horizon Boundary Topography and Distinctness	Redox Feature Color	Redox Feature Description	Lab Sample ID
0	0-2	2.5YR												508-15
A	2-4	10YR 3/1	Ch 10%	1-5"	sil	30	15	PS S0	1P sbk	Fr	a/s			MF/mm/ FC
Eg	4-7	10YR 5/2	qf 25%	1-2"	l	40	16	PS S5	1m sbk	Fr	C/S			MF/cm/ FC
Btg	7-16	2.5Y 6/1	qf 20%	1-3"	l	38	23	PS S5	1m sbk	Fr	—			MF/cm/ FC

Bedrock Notes:

Water Table?

Y/N

Description: water seep under A horizon Filled pit to 16"

Indications of slips or slope failures?

Y/N

Description: upslope slide may have extended into area

Special Features?

Y/N

Description:

Dominant Vegetation:

maple / hickory oak / greenbrier / solomon's seal / grass

Other Notes:

pit is 22" deep

TEST PIT DESCRIPTION

Soil Scientist: D. Fenske-Machner Signature: David Fenske-Machner
 Field Assistant: Devin Galka

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1053

Test Pit ID: R-160511-0900-MPC-15 R-015-160511-0900-MPC
 Date: 5/11/10
 Job Name: Dominion - Atlantic Coast Pipeline Soil Survey
 RETTEW Job #: 089962000
 NRCS Soil Unit: Craigsville (27)
 Soil Series: Craigsville fine sandy loam

Topographic Position: Footslope/Floodplain
 % Slope / Aspect: 4% 200°
 Drainage Class: A1" Moderately Well Drained
 Depth to Refusal: N/A
 Bedrock Type and Dip Slope: N/A
 Mineralogy: Mixed

Horizon	Depth in inches	Matrix Color	Rock Fragment Type and %	Rock Fragment Size (inches)	Texture Class	% sand	% clay	Plasticity / Stickiness	Structure Type, Grade, and Size	Moist Consistency	Horizon Boundary Topography and Distinctness	Redox Feature		Lab Sample ID
												Color	Description	
O:	0-15	10YR 3/1	-	-	-	-	-	P0	-	-	A W			Chrysochlorite
A	1.5-4	10YR 3/1	15% CH	4 1/8"	SIL	15	8	P0	2MGR	VFC	CW			Common med + Co. many fine
B1	4-8.5	10YR 6/6	25% CH	4 1/8"	SIL	10	14	S5	M/SBK	VFC	CW			Many fine
B2	8.5-10	10YR 6/6	45% CH	1/2-7"	SIL	10	18	S5	M/SBK	FR	CS			Lemon Spitz few med
B3	10-35	10YR 5/6	60% CH	1/2-8"	SIL	25	15	S5	M/SBK	FR	CW			Common med
B4	35-50	10YR 5/6	55% CH-Flags	1/2-12"	SIL	10	24	M/P	10S9L	F/CO	-			few fine

Notes observed

Bedrock Notes: None observed

Water Table? Y / N Description: _____

Indications of slips or slope failures? Y / N Description: _____

Special Features? Y / N Description: White pine, white oak, Ironwood, Dogwood

Dominant Vegetation: Sugar maple

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Jessie W. W.

Signature: Jessie W. W.

RETTEW Associates, Inc.
3020 Columbia Avenue
Lancaster, PA 17603
Phone: 717-394-3721
Fax: 717-394-1063

Test Pit ID: R-016-160511-0910-MPC
 Date: 5/11/16
 Job Name: Domion - Atlantic Coast Pipeline Soil Survey
 RETTEW Job #: 089962000
 NCRS Soil Unit: Berks (8E)
 Soil Series: Berks channery silt loam, 25-45% slopes

Topographic Position: UPPER BACKSLOPE
 % Slope / Aspect: 20%
 Drainage Class: W
 Depth to Refusal: 20
 Bedrock Type and Dip Slope: Not clearly defined
 Mineralogy: Mixed

Horizon	Depth in Inches	Matrix Color	Rock Fragment Type and %	Rock Fragment Size (inches)	Texture Class	% sand	% clay	Plasticity / Stickiness	Structure Type, Grade, and Size	Moist Consistence	Horizon Boundary Topography and Distinctness	Redox Feature Color	Redox Feature Description	Lab Sample ID
O	0-1	5YR 2/1									AS			
A	1-2.5	10YR 2/1	10	<0.5	S/L	30	11	PO	1MSBK	FR	CS			M-F (M, C)
B ₁	2.5-7	10YR 2/4	25	1-2	SL	30	14	PO	1MSBK	FR	CS			M-F (M, C-N)
B ₂	7-20	10YR 2/4	80	2-4	SL	32	15	PO	0WA	FR	CS			C-F
R	-	-	-	-	-	-	-	-	-	-	-			

Bedrock Notes: Siltstone, no clear bedding planes

Water Table? Y/N Description: _____

Special Features? Y/N Description: _____

Dominant Vegetation: MIXED DECIDUOUS, PRESENTLY CUT - MAPLE, CHESTNUT OAK, VA PINE, WHITE PINE, BLUEBERRY, YAWEEV, LIGUEN, PENNY

Other Notes: _____

TEST PIT DESCRIPTION

Soil Scientist: Dan Fenstermaker
 Field Assistant: Sam Galbraith

Signature: Sam Galbraith

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	R-106511-1000-MPC-17 R-017-160511-1000-MPC	Topographic Position:	Balk 1/4 sec
Date:	5/11/10	% Slope / Aspect:	25-45% 270°
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey	Drainage Class:	Somewhat excessively drained
RETTEW Job #:	089962000	Depth to Refusal:	20"
NRCS Soil Unit:	Berks (8E)	Bedrock Type and Dip Slope:	10° shale
Soil Series:	Berks channery silt loam, 25-45% slopes	Mineralogy:	Mixed

Horizon	Depth in Inches	Matrix Color	Rock Fragment Type and %	Rock Fragment Size (inches)	Texture Class	% sand	% clay	Plasticity / Stickiness	Structure Type, Grade, and Size	Moist Consistence	Horizon Boundary Topography and Distinctness	Redox Feature Color	Redox Feature Description	Lab Sample ID
Qe	0-0.85	Syn 25/11	-	-	-	-	-	SP0 D50	1M6r	VF	AW			
A	0.85-1.04	4/3	30% CH	1/8-2	S.L	25	12	SP 80	1F5Bk	VFC	AW			Many fine med
Bw	1.04-1.13	105H	40% CH	1/8-2	S.L	20	14	SP 55	1F5Bk	F	CW			Many fine med
Bw	1.13-1.75	104K 6/14	48% CH	1/8-3	S.L	20	14	SP 95	1M6Bk	F	CW			Common fine few med
Cr	1.75-1.90	104K 6/14	98% CH	1/2-3"	-	-	-	-	photo red on rock	-	CW			Few fine
R	1.90+	no fine	fractures	fractures	as	-	-	-	fractures	-	-			None

Bedrock Notes: Shale dipping to East 10° down strike of 300° E. 10" fractures 1/2" thick 3-8" pieces

Water Table? Y/N Description: _____
 Indications of slips or slope failures? Y/N Description: Cambic
 Special Features? Y/N Description: _____
 Dominant Vegetation: _____
 Other Notes: _____

TEST PIT DESCRIPTION

Soil Scientist: DEF, J9

Signature: David J. Sturman

Field Assistant:

RETTEW Associates, Inc.
3020 Columbia Avenue
Lancaster, PA 17603
Phone: 717-394-3721
Fax: 717-394-1063

Test Pit ID: R-160511-1145-MPC-18R-018-160511-1145-MPC
 Date: 5/11/16
 Job Name: Dominion - Atlantic Coast Pipeline Soil Survey
 RETTEW Job #: 089962000
 NRCSS Soil Unit: Craigsville (27)
 Soil Series: Craigsville fine sandy loam

Horizon	Depth in Inches	Matrix Color	Rock Fragment Type and %	Rock Fragment Size (Inches)	Texture Class	% sand	% clay	Plasticity / Stickiness	Structure Type, Grade, and Size	Moist Consistence	Horizon Boundary Topography and Distinctness	Redox Feature Color	Redox Feature Description	Lab Sample ID
A	0-2.5	10YR2/2	2	<0.25	gIL	15	12	SP SS	1F3BK	FR	CW	-	-	M-F, M, Co
Bm1	2.5-8.5	10YR2/1.5	5	<0.5	gIL	5	15	PM SM	1M3BK	FR	CS	-	-	M-F, Co
Bm2	8.5-10	10YR2/1.5	15	<1	gR	5	18	SP PS	1M3BK	FR	CS	-	-	C-F, M F-Co
Bm3	10-30	10YR2/1.5	45	<1	L	45	14	PS SD	1M3BK	FR	CS	-	-	C-F
pc	30-80	10YR5/1.5	80	<1	gIL	35	14	SO PD	DM3A	VFR	-	C: C2E D: -	10YR5/6	F-F

Bedrock Notes:

Water Table? N Description: 37"

Indications of slips or slope failures? N Description:

Special Features? N Description:

Dominant Vegetation: WILD BERRY, BIRCH, OAK, MAPLE, YACHT, WHITE PINE

Other Notes: V. IN OBVIOUS HORIZON, <0.25" VERTICAL, CONCRETE SIGN

TEST PIT DESCRIPTION

Soil Scientist: **DAN FEUSTEL** Signature: *Dan Feustel*

Field Assistant: *Talyn Sipe*

RETTEW Associates, Inc.
3020 Columbia Avenue
Langcaster, PA 17603
Phone: 717-394-3721
Fax: 717-394-1063

Test Pit ID: **R-160512-1020-MPC** *1020* *19*
 Date: **S-12-16**
 Job Name: **1040-MIR-25R-019-160512-1020-MPC**
 RETTEW Job #: **089962000**
 NRCS Soil Unit: **Paddy Knob (PAME)**
 Soil Series: **Paddyknob-Madsheep Complex, 15-35% slopes, very stony**
 Topographic Position: **SUMMIT**
 % Slope / Aspect: **1/0° 340°**
 Drainage Class: **WFCU DRAINED**
 Depth to Refusal: **42"**
 Bedrock Type and Dip Slope: **M/A**
 Mineralogy: **Mixed**
 USDA: **GRAV SAND STONE (MEDIUM GRAINED)**

Horizon	Depth in inches	Matrix Color	Rock Fragment Type and %	Rock Fragment Size (inches)	Texture Class	% sand	% clay	Plasticity / Stickiness	Structure Type, Grade, and Size	Moist Consistency	Horizon Boundary Topography and Distinctness	Redox Feature Color	Redox Feature Description	ROOTS
Oe	0-2	2.5YR 2.5/1	-	-	-	-	-	-	WF GR	VFR	A-W	-	-	-
A	2-5	2.5YR 2.5/1	15% CB	4-6	CB SAL	65	12	PO SO	WF SF SRK	VFR	A-W	-	-	M-C
AB	5-9	2.5YR 2.5/1	25% CO	3-8	CB SAL	65	12	PO SO	WF M SRK	VFR	A-W	-	-	M-C
Bw1	9-22	2.5YR 2.5/1	45% CB	0.5-6	VCB SAL	65	13	SO SP	WF M SRK	VFR	C-W	-	-	M-C
Bw2	22-30	2.5YR 2.5/1	65% CB	1-5	XGR SAL	55	14	SS SP	WF M SRK	VFR	C-W	-	-	M-C
Bw3	30-38	2.5YR 2.5/1	80% CB	4-8	XEB L	50	16	SO SP	WF V SRK	F	C-W	-	-	M-C
C	38-45	2.5YR 2.5/1	90% STONES	12-24	XST SAL	55	14	SO SP	OM A	VFR	A-W	-	-	F-C

Bedrock Notes: *Not observed - highly fractured competent sandstone at bottom w/ fissure fractures*

Water Table? Description: *90% Rock w/ stones*

Indications of slips or slope failures? Description: *MIXED DECIDUOUS - WICKONN / W/ASH / SKYPIE*

Special Features? Y/N Description: *MIXED DECIDUOUS - WICKONN / W/ASH / SKYPIE*

Dominant Vegetation: *MIXED DECIDUOUS - WICKONN / W/ASH / SKYPIE*

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Dan Fenstermaker Signature: David Fenstermaker
 Field Assistant: Sara Geyer

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1065

Test Pit ID: R-160512-1040-MPC-20 R-020-160512-1040-MPC
 Date: 5/19/16
 Job Name: Dominion - Atlantic Coast Pipeline Soil Survey
 RETTEW Job #: 089962000
 NRCS Soil Unit: Paddy Knob (PamE)
 Soil Series: Paddy Knob-Madsheep Complex, 15-35% slopes, very stony
 USDA
 Topographic Position: Backslope 30 below shoulder
 % Slope / Aspect: 40% 399°
 Drainage Class: M Well Drained
 Depth to Refusal: 41
 Bedrock Type and Dip Slope: g222 ss
 Mineralogy: Mixed

Horizon	Depth in inches	Matrix Color	Rock Fragment Type and %	Rock Fragment Size (inches)	Texture Class	% sand	% clay	Plasticity / Stickiness	Structure Type, Grade, and Size	Moist Consistence	Horizon Boundary Topography and Distinctness	Redox Feature Color	Redox Feature Description	Lab Sample ID
0e	0-2	gray	-	-	-	-	-	-	-	-	cn	-	-	M-F, M
A	2-4	gray	30	<0.5	vr	50	12	po	1-30K	vr	cn	-	-	M-F, M
Bw1	4-11	gray	30	<0.25	vr	48	12	po	1-MSBK	vr	cn	-	-	M-F, M
Bw2	11-20	gray	45	<1	vr	40	13	ss	1-MSBK	vr	cn	-	-	M-F, M
Bw3	20-21	gray	65	<1	vr	25	15	ss	1-MSBK	vr	cn	-	-	M-F, M
Bc	21-28	gray	65	1-4	vr	25	18	po	1-MSBK	vr	as	-	-	F-F
Dk	28-31	gray	75	-	vr	-	-	ss	1-MSBK	vr	-	-	-	-

Bedrock Notes:

Water Table? Y(N) Description: _____
 Indications of slips or slope failures? Y(N) Description: _____
 Special Features? Y/N Description: _____
 Dominant Vegetation: Mixed grass trees - oak - white oak striped maple
 Other Notes: _____

Pocket Penetrometer

g222 ss
 sandstone
 M-F, M
 F-F
 M-F, M
 M-F, M
 M-F, M
 F-F
 F-F
 F-F

TEST PIT DESCRIPTION

Soil Scientist: John A. ...

Signature: [Handwritten Signature]

RETTEW Associates, Inc.
3020 Columbia Avenue
Lancaster, PA 17603
Phone: 717-394-3721
Fax: 717-394-1063

Test Pit ID: R-160512-110-MPC Topographic Position: 1447' 228'

Date: 5/2/16 % Slope / Aspect: W Well Drained

Job Name: Dominion - Atlantic Coast Pipeline Soil Survey Drainage Class: W Well Drained

RETTEW Job #: 089962000 Depth to Refusal: 23"

NRCS Soil Unit: Paddyknob-Madshoop Complex (PamE) Bedrock Type and Dip Slope: None Observed N10W, 25°

Soil Series: Paddyknob-Madshoop Complex, 15-35% slopes, very stony Mineralogy: Mixed

Horizon	Depth in inches	Matrix Color	Rock Fragment Type and %	Rock Fragment Size (inches)	Texture Class	% sand	% clay	Plasticity / Stickiness	Structure Type, Grade, and Size	Moist Consistence	Horizon Boundary Topography and Distinctness	Redox Feature Color	Redox Feature Description	Lab Sample ID
0	0-10	8YR 2/1	—	—	—	—	—	—	—	—	as	—	—	—
1-3	10-20	10YR 2/1	20	1	SL	80	8	PO	1.5SK	WPR	as	—	—	3.5 3.5 3.5
1-2.5	20-30	10YR 2/1	30	2-3	SL	65	10	PO	1.5SK	WPR	as	—	—	3.5 3.5 3.5
1-5	30-40	10YR 2/1	85	3-5	SL	65	10	PO	1.5SK	WPR	as	—	—	3.5 3.5 3.5

Bedrock Notes: Y/N Description: _____

Water Table? Y/N Description: _____

Indications of slips or slope failures? Y/N Description: _____

Special Features? Y/N Description: _____

Dominant Vegetation: ALDER, BIRCH, PINE, SWEET GUM, WHITE OAK, YEW

Other Notes: _____

TEST PIT DESCRIPTION

Soil Scientist: **DAN FEINSTEIN** Signature: *Dan Feinstein*

Field Assistant: **R160512-1155-MRC-22**
Dan Feinstein & John Walsh

mid back

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-594-3721
 Fax: 717-594-1053

Test Pit ID: **R-160512-1155-MRC-22** R-022-160512-1155-MPC
 Date: **5-12-16**
 Job Name: **Dominion - Atlantic Coast Pipeline Soil Survey**
 RETTEW Job #: **089962000**
 NRCS Soil Unit: **PADDY KNOB (PAME)**
 Soil Series: **Paddyknob-Madsheep Complex, 15-35% slopes, very stony**

Horizon	Depth in inches	Matrix Color	Rock Fragment Type and %	Rock Fragment Size (inches)	Texture Class	% sand	% clay	Plasticity / Stickiness	Structure Type, Grade, and Size	Moist Consistence	Horizon Boundary Topography and Distinctness	Redox Feature Color	Redox Feature Description	Roots / Lab Sample ID
De	0-0.5	5/10 25/10	—	—	—	—	—	—	—	—	AW	—	—	—
AR	0.5-2.5	5/10 3/10	20% CH	2 1/8"	L	40	12	NP NS	1 MGR	VFC	AW	—	—	Moist Field, many roots, red color
Bw1	2.5-11	25/10 3/10	34% S	2 1/8"	SLL	30	14	SP SP	1 SGR	VFC	CS	—	—	Many fine roots, coarse
Bw2	11-22	25/10 3/10	45% S	2 1/8"	S.L	10	13	SP SP	1 MGR	FC	CW	—	—	Common fine
Cc	22-36	25/10 10/10	99% Gr	2 1/8"	—	—	—	—	OM Rock exposed	—	GS	—	—	Red fine, soft soil, break
R	36+	—	—	—	—	—	—	—	—	—	—	—	—	Red SILTSTONE

Redbed siltstone - no clear planes - breaks on or cracks.

Bedrock Notes: **Y** Description: **Y**
 Water Table? **Y** Description: **Y**
 Indications of slips or slope failures? **Y** Description: **Y**

Special Features? **Y/N** Description: **Y/N**
 Dominant Vegetation: **MIXED DECIDUOUS - Hickory - white ash - sugar maple - Red oak**

Other Notes: **Available bit of columnar structure on surface horizon**

Chestnut oak

TEST PIT DESCRIPTION

Soil Scientist: David West

Signature: [Signature]

Field Assistant: _____

RETTEW Associates, Inc.
3020 Columbia Avenue
Lancaster, PA 17603
Phone: 717-394-3721
Fax: 717-394-1063

Test Pit ID: R-023-160512-1310-MPC

Date: 7/12/12

Job Name: Domion - Atlantic Coast Pipeline Soil Survey

RETTEW Job #: 089962000

NRCS Soil Unit: Berks (BfC)

Soil Series: Berks channery silt loam, 3-15% slopes, very stony

Topographic Position: SUMMIT

% Slope / Aspect: 37 95°

Drainage Class: Well Drained

Depth to Refusal: 24"

Bedrock Type and Dip Slope: FR 55

Mineralogy: Mixed

USDA														
Horizon	Depth in inches	Matrix Color	Rock Fragment Type and %	Rock Fragment Size (inches)	Texture Class	% sand	% clay	Plasticity / Stickiness	Structure Type, Grade, and Size	Moist Consistence	Horizon Boundary Topography and Distinctness	Redox Feature Color	Redox Feature Description	Lab Sample ID
	0-1.5	10YR 5/1	-	-	-	-	-	-	-	-	a-s	-	-	3E
	1.5-3	10YR 2/1	5	20.5	SIL	12	12	50	145BK	VRL	a-s	-	-	3E
	3-4	10YR 3/1	25	20.5	GR SIL	15	15	55	145BK	FR	cm	-	-	3E
	4-15	10YR 3/1	36	21	VRL SIL	16	14	55	145BK	FR	cm	-	-	3E
	15-25	10YR 5/1	90	2-4	VRL SIL	15	15	55	145BK	FR	cm	-	-	2F
	25-34	10YR 5/1	100	4-24	VRL SIL	15	15	55	145BK	FR	cm	-	-	

Bedrock Notes: _____

Water Table? Y N Description: _____

Indications of slips or slope failures? Y N Description: _____

Special Features? Y N Description: _____

Dominant Vegetation: WOODLAND - OAK, MAPLE, SWEETGUM, BEECH

Other Notes: _____

TEST PIT DESCRIPTION

Soil Scientist: DEF Signature: David S. Suter
 Field Assistant: Shm Wark

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-594-3721
 Fax: 717-394-1063

Test Pit ID: R-024-160512-1320-MPC
 Date: 7/22/16
 Job Name: Dominion - Atlantic Coast Pipeline Soil Survey
 RETTEW Job #: 089962000
 NRCS Soil Unit: Berks - New Street (BIE)
 Soil Series: Berks channery siltloam, 15-35% slopes, very stony

USDA														
Horizon	Depth in inches	Matrix Color	Rock Fragment Type and %	Rock Fragment Size (inches)	Texture Class	% sand	% clay	Plasticity / Stickiness	Structure Type, Grade, and Size	Moist Consistence	Horizon Boundary Topography and Distinctness	Redox Feature Color	Redox Feature Description	Lab Sample ID
A	0-0.5	grey/1			SL	12	15	10 P6	1F5BK	VF	CW	1	1	3F 1M 1C
BB	0.5-3.5	grey/1			SL	12	15	10 P6	1F5BK	VF	CW	1	1	3F 1M 1C
BW	3.5-10	grey/1			SL	12	15	10 P6	1F5BK	VF	CW	1	1	3F 1M 1C
C1	10-24	grey/1			SL	12	15	10 P6	1F5BK	VF	CW	1	1	3F 1M 1C
C2	24-26	grey/1			SL	12	15	10 P6	1F5BK	VF	CW	1	1	3F 1M 1C
R	26+	grey/1			SL	12	15	10 P6	1F5BK	VF	CW	1	1	3F 1M 1C

Bedrock Notes: Shale - rios to 1/2-1" thick pieces

Water Table? Y/N Description: _____
 Indications of slips or slope failures? Y/N Description: _____

Special Features? Y/N Description: _____
 Dominant Vegetation: Red maple white oak chestnut oak blueberry

Other Notes: all the bits & columns influence on surface horizon

29 2"

Sandstone
 Cap
 shale cap

TEST PIT DESCRIPTION

Soil Scientist: Don Fenimore Signature: David Swartzman
 Field Assistant: _____

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1053

Test Pit ID: R-160512-1430-MPC-25 R-025-160512-1420-MPC
 Date: 5/18/10
 Job Name: Domion - Atlantic Coast Pipeline Soil Survey
 RETTEW Job #: 083962000
 NRCS Soil Unit: BeVls (BE)
 Soil Series: Berks channely silt loam, 15-35% slopes, very stony
 Topographic Position: Backbone
 % Slope / Aspect: 30%
 Drainage Class: Well Drained
 Depth to Refusal: 36"
 Bedrock Type and Dip Slope: N/S
 Mineralogy: Mixed
 USDA
 M^o Dawson
Shocks
30°

Horizon	Depth in inches	Matrix Color	Rock Fragment Type and %	Rock Fragment Size (inches)	Texture Class	% sand	% clay	Plasticity / Stickiness	Structure Type, Grade, and Size	Moist Consistency	Horizon Boundary Topography and Distinctness	Redox Feature Color	Redox Feature Description	Lab Sample ID
<u>0-3</u>	<u>SVR 25/0</u>	<u>25/0</u>	<u>Red surface clays</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>1/4gr</u>	<u>ufr</u>	<u>AW</u>	<u>✓</u>	<u>✓</u>	<u>many fine sand med</u>
<u>AE</u>	<u>3-5</u>	<u>10YR 7/2</u>	<u>25% CH</u>	<u>2 1"</u>	<u>S.L</u>	<u>18</u>	<u>12</u>	<u>SP</u>	<u>1/2gr</u>	<u>ufr</u>	<u>AW</u>	<u>✓</u>	<u>✓</u>	<u>many fine med med coarse</u>
<u>0.75</u>	<u>5-10.5</u>	<u>10YR 5/4</u>	<u>25% CH</u>	<u>2 1"</u>	<u>S.L</u>	<u>12</u>	<u>14</u>	<u>SP</u>	<u>1/2gr</u>	<u>fr</u>	<u>CU</u>	<u>✓</u>	<u>✓</u>	<u>Common fine common med</u>
<u>0.25</u>	<u>10.5-25</u>	<u>10YR 5/4</u>	<u>25% CH</u>	<u>1/2-8"</u>	<u>S.L</u>	<u>14</u>	<u>14</u>	<u>SP</u>	<u>1/2gr</u>	<u>fr</u>	<u>AW</u>	<u>✓</u>	<u>✓</u>	<u>Common fine common med</u>
<u>0.25</u>	<u>25-36</u>	<u>10YR 5/3</u>	<u>99% CH</u>	<u>1/2-5"</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>om</u>	<u>-</u>	<u>CS</u>	<u>✓</u>	<u>✓</u>	<u>Red med soft shale</u>
<u>3R</u>	<u>36+</u>	<u>Siltstone</u>	<u>Bedrock</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>

Bedrock
by hand
few fine

Bedrock Notes: Siltstone matrix gray - not clearly bedded - (uboidal structure - appears to dip down
 Water Table? Y Description: flowery of mag. silty sh. shale - R. siltstone in the side
 Indications of slips or slope failures? Y/N Description: _____
 Special Features? Y/N Description: _____
 Dominant Vegetation: chestnut oak, white pine, Red oak, 3 Red maple, white pine, blueberry
 Other Notes: Residuum

TEST PIT DESCRIPTION

Soil Scientist: Richard W. Smith

Signature: [Signature]

Field Assistant: _____

R-026-1605F13-1000-MPC

RETTEW Associates, Inc.
3020 Columbia Avenue
Lancaster, PA 17603
Phone: 717-394-3721
Fax: 717-394-1063

Test Pit ID: R-1605F13-1000-MPC-26

Date: 5/13/16

Job Name: Dominion - Atlantic Coast Pipeline Soil Survey

RETTEW Job #: 089962000

NRCS Soil Unit: Elliber (EIF)

Soil Series: Elliber extremely channery silt loam, 35-55% slopes

Topographic Position: _____

% Slope / Aspect: _____

Drainage Class: W Well Drained

Depth to Refusal: _____

Bedrock Type and Dip Slope: _____

Mineralogy: _____

USDA: _____

Mixed

Horizon	Depth in inches	Matrix Color	Rock Fragment Type and %	Rock Fragment Size (inches)	Texture Class	% sand	% clay	Plasticity / Stickiness	Structure Type, Grade, and Size	Moist Consistence	Horizon Boundary Topography and Distinctness	Redox Feature Color	Redox Feature Description	Lab Sample ID
00	0-3	5YR 5/1	-	-	-	-	-	-	-	-	as	-	-	-
A	3-6	10YR 5/2	50	<1	VR	30	10	PO	CFBRK	VR	CS	-	-	3E 3M 1000
BA	6-10	10YR 5/2	60	<1	VR	45	10	PO	CFBRK	FR	CM	-	-	3E 3M
Bp1	10-15	10YR 5/1	75	1	VR	25	16	SP	CFBRK	FR	QS	-	-	3E 3M 1000
Bp2	15-20	10YR 5/1	80	<3	VR	50	8	PO	CFBRK	FR	-	-	-	2E 2M

Bedrock Notes:

Water Table? Y/N

Description: _____

Indications of slips or slope failures? Y/N

Description: _____

Special Features? Y/N

Description: _____

Dominant Vegetation:

Mixed woods - oak, maple, white pine, laurel

Other Notes:

Area of soil, sand and gravel is present in channels

Pocket Penetrometer

0.75
1.25
1.0
1.0

TEST PIT DESCRIPTION

Soil Scientist: Don Fenslermacher Signature: David Fenslermacher
 Field Assistant: _____

Test Pit ID: ~~R-027-160513-1000-MPC~~ R-027-160513-1000-MPC
 Date: 5/19/16
 Job Name: Dominion - Atlantic Coast Pipeline Soil Survey
 RETTEW Job #: 089962000
 NRCS Soil Unit: Elizabet (E1F)
 Soil Series: Elizabet extremely channery silt loam, 35-55% slopes

Horizon	Depth in inches	Matrix Color	Rock Fragment Type and %	Rock Fragment Size (inches)	Texture Class	% sand	% clay	Plasticity / Stickiness	Structure Type, Grade, and Size	Moist Consistence	Horizon Boundary Topography and Distinctness	Redox Feature Color	Redox Feature Description	Lab Sample ID
D	0-0.5	5YR 2/1	-	-	-	-	-	-	1-2mm	-	AW	-	-	Very fine, med. clay
A	0.5-2	10YR 3/2	10YR CH	4-1/2"	Sic	10	15	SP	1f SBK	VF	AW	-	-	Very fine, med. clay
B _{1E}	2-6	10YR 5/8+	10YR CH	2-1"	Sic	12	15	SP	1f SBK	F ₁	CW	-	-	Many fine med common loam
B ₁	6-11	7.5YR 5/3	20YR CH	<1"	SicL	15	29	SP	2f SBK	F ₁	CS	-	-	Many fine, common med clay
B ₁₂	11-22	7.5YR 5/4	4.5YR CH	<1.5"	SicL	16	35	MP	2MSBK	F ₁	AW	-	-	Common fine clay films
C	22-26	10YR 5/3	9.5YR CH	<3"	-	-	-	MS	Rec. hor. OM	-	GW	-	-	Low fine clay films
R	26-30+	Bedded	Bedded	Bedded	Shale bedrock	-	-	-	High carbon	-	(black)	-	-	Very soft shale bedded

Bedrock Notes: Fractured shale bedrock-high carbon pipes with slope

Water Table? Y/N Description: 33" Thru lign CR + R

Indications of slips or slope failures? Y/N Description: _____

Special Features? Y/N Description: White pine, white oak, red maple, blueberry

Dominant Vegetation: residual - rain showers over night in AM

Other Notes: _____

TEST PIT DESCRIPTION

Soil Scientist: James West
Field Assistant: _____

Signature: _____

RETTEW Associates, Inc.
3020 Columbia Avenue
Langaster, PA 17603
Phone: 717-394-3721
Fax: 717-394-1063

Test Pit ID: R-160513-1210-MPC-28 R-028-160513-1210-MPC
Date: 5/13/16
Job Name: Dominion - Atlantic Coast Pipeline Soil Survey
RETTEW Job #: 089962000
NRCS Soil Unit: Calvin-Dekalb-Berks Complex (Cdf)
Soil Series: Calvin-Dekalb-Berks Complex, 35-55% slopes, very stony

USDA
Topographic Position: _____
% Slope / Aspect: _____
Drainage Class: N Well Drained
Depth to Refusal: _____
Bedrock Type and Dip Slope: _____
Mineralogy: Mixed

Horizon	Depth in inches	Matrix Color	Rock Fragment Type and %	Rock Fragment Size (inches)	Texture Class	% sand	% clay	Plasticity / Stickness	Structure Type, Grade, and Size	Moist Consistence	Horizon Boundary Topography and Distinctness	Redox Feature Color	Redox Feature Description	Lab Sample ID
0a	0-3	gray	-	-	-	-	-	-	-	-	CS	-	-	-
As	3-4	gray	S	<2	SL	10	10	SP	2-4 R	VER	CS	-	-	3F 3M
BA	4-8	gray	15	1-2	SL	25	15	SP	1 M, 1 B	PR	CS	-	-	3F 3M
Bw	8-16	gray	10	1-2	SL	30	16	SP	2-4 R	PR	CS	-	-	3F 3M
2B(1)	16-30	gray	10	1-2	SL	18	32	SP	2-4 R	FR	CS	-	-	3F 3M
2B(2)	30-50	gray	0	-	SL	10	37	MS	2-4 R	F1	CS	-	-	2E
2B(3)	50-50	gray	0	-	SL	5	41	MS	2-4 R	F1	-	-	-	1E

Bedrock Notes: Thin, concave, shale

Water Table? Y/N Description: _____

Indications of slips or slope failures? Y/N Description: _____

Special Features? Y/N Description: _____

Dominant Vegetation: Maple, Deciduous, Sp. Maple, Oak, Chestnut Oak, White Oak, Buckeye

Other Notes: 20 M to E 15 M SW. Berks nod. stones on surface. 0.25 N2.5 M; white gravel nodules; concave over residuum

Curry
Skids
Curry
Skids
Curry
Skids

TEST PIT DESCRIPTION

Soil Scientist: DEREK STEINBUCK Signature: David Steinbuck
 Field Assistant: _____

RETTEW/Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	R-160513-1300-MPC-09 R-029-160513-1300-MPC	Topographic Position:	Backslope
Date:	5/13/16	% Slope / Aspect:	19% ESE
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey	Drainage Class:	Well Drained
RETTEW Job #:	089962000	Depth to Refusal:	50"
NRCS Soil Unit:	Calvin-Dekalb-Berks Complex (CdE)	Bedrock Type and Dip Slope:	N/A
Soil Series:	Calvin-Dekalb-Berks Complex, 15-35% slopes, very stony	Mineralogy:	Mixed

Horizon	Depth in inches	Matrix Color	Rock Fragment Type and %	Rock Fragment Size (inches)	Texture Class	% sand	% clay	Plasticity / Stickiness	Structure Type, Grade, and Size	Moist Consistence	Horizon Boundary Topography and Distinctness	Redox Feature Color	Redox Feature Description	Lab Sample ID
A	0-4.5	5YR 2.5/1.9	15.9%	LS 3-6"	LS	85	8	S6	1F5gk	VFr	A W			
BE	4.5-13	2.5YR 3/3	20%	LS 1/2"	LS	86	8	S0	1F5gk	VFr	CS			
Bw	13-29	2.5YR 2.5/3	35%	LS 1/2"	LS	88	8	S0	1M5gk	VFr	CS			
2Bd	29-39	5YR 4/4	5%	LS 1/2"	SL	78	14	S5	1F5gk	Fr	RES			
2Bc	39-39	7.5YR 5/6	20%	LS 1/2"	SL	62	24	S5	1M5gk	Fr	AS			
C	39-50x	2.5YR 2.5/4.8	0%	LS 1/2"	SIC	5	43	M5	OM	Fp				

Bedrock Notes: None observed
 Water Table? Y/N Description: _____
 Indications of slips or slope failures? Y/N Description: _____

Dominant Vegetation? Y/N Description: chestnut oak white pine hickory blueberry
 Other Notes: very thin O horizon LO, 2.5"

Calvinium over residuum with Oa Bw being a mixed transitional horizon

pHed

Many fine roots

col have rounded edges

Redox band SS

Mixing of ped with common fine cement

recrystallizing on ped surface few fine roots

Fe features

Not redox - 1.1% chromic

Attachment 4
Soil Survey Test Pit Logs

TEST PIT DESCRIPTION

Soil Scientist: Russell Losco
 Field Assistant: Steph Maraca

Signature: 

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	Date:	Job Name:	RETTEW Job #:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	% Slope:	Drainage Class:	Depth to Refusal:	Bedrock Type:	Vegetation:	Parent material:	Slope Aspect:	Depth to Water Table:	Slope Failure or slip:	Dip Slope & Direction:	Residuum	Lab Sample ID	Notes	
						Backslope	36%	MUD	50"	Siltstone	Maples									
	6/20/2010	Dominion - Atlantic Coast Pipeline Soil Survey	089962000	CFE	Mixed						USDA									
0a	3	5YR2.5/1																		
Bw	10	5YR2.5/1	SIL 20	3	ST 50%	1/4"	MP NS	F2SBK	FR	CS									S1	
Bt	24	2.5YR2.5/1	SIL 20	3	CN 25%	1/2" x 2	SP SS	F1SBK	FR	GS									S2	
Cr	50	2.5YR2.5/1	SIL 20	3	ST 60%	1/2" x 1	SP MS	DM	F1										S3	
R	50+																			

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Russell Losco
 Field Assistant: Steph Moraca

Signature: [Signature]

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063


Test Pit ID:	P007-16062D-1020RLL													
Date:	6/20/2016													
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey													
RETTEW Job #:	089962000													
NRCS Soil Unit:	CFE Mixed													
Mineralogy:	Mixed													
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Structure Type, Grade, and Size	Moist Consistence	Redox Feature Color	Redox Feature Description	Roots	Lab Sample ID	Notes
Da	3	50R2.5/1	—	—	—	—	—	F1GR	FR	CLS	—	2F, 1M	0 4.75	
Bt ₁	15	7.5YR5/4	S:DL	30	5	5% ST	1/4"	F8BKL	FR	GS	—	3F, 1M	4.5 4.5	
Bt ₂	24	10YR6/4	S:IL	28	6	5% ST	1/4"	F15BK	FR	CLB	—	1F	4.5 4.75	
C _r	38	10YR6/3 10YR6/1	S:IL	18	20	50% ST	1/2 - 3/4"	OM	FR	—	—	1F	4.5+ 4.75	
R	38+													

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Russell Lasco

Field Assistant: Steph Morara

Signature: 


Test Pit ID:	Date:	Job Name:	RETTEW Job #:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	% Slope:	Drainage Class:	Depth to Refusal:	Bedrock Type:	Vegetation:	Parent material:	Slope Aspect:	Depth to Water Table:	Slope Failure or slip:	Dip Slope & Direction:	Strike:	Notes	
P003-160620-1025-RL	6/20/2016	Dominion - Atlantic Coast Pipeline Soil Survey	089962000	CPE Mixed		Backslope	58%	W5	50"	SD	Red Hardloam & Beach USDA								
A	6	250R ^{25%}		SIL	17	3	—	—	—	SD SD	FLGR	FR	CS	—	—	2F2M	0	4.5	S1
Bw	17	250R ^{4H}		SIL	18	3	10%	ST	1/2"	SD SP	H2GR	FR	CS	—	—	1F	1.75	4.75	S3
Bt	32	250R ^{25%}		SCL	30	5	25%	ST	1/2-3/4"	MP MS	M2SR	FR	GS	—	—	1F	4.5+	5.0	S4
Cc	50	250R ^{5%}		SIL	20	8	40%	ST	3/4"-1"	SP SS	F1SR	FR	—	—	—	—	3.5	5.25	

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Russell Horco
 Field Assistant: Steph Maraca

Signature: _____



RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID: P004-160620-1035-KLL
 Date: 4/20/2016
 Job Name: Dominion - Atlantic Coast Pipeline Soil Survey
 RETTEW Job #: 089962000
 NCRS Soil Unit: CTE
 Mineralogy: Mixed

Topographic Position: Backslope
 % Slope: 60%
 Drainage Class: WD
 Depth to Refusal: 50"
 Bedrock Type: Siltstone & Beach
 Vegetation: Red Maple & Birch

Parent material: Residuum
 Slope Aspect: 180
 Depth to Water Table: 50+"
 Slope Failure or slip: _____
 Dip Slope & Direction: _____
 Strike: _____

Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture/Structure	Structure Type, Grade, and Size	Moist Consistence	Moisture Boundary	Redox Feature Color	Redox Feature Description	Roots	Moisture/Structure	Lab Sample ID	Notes
0a	2	5YR2.5/1	—	—	—	—	—	—	FR	FR	CS	—	—	3F, 2M	0		
A	6	2.5YR2.5/2	SiL	22	3	10% ST	1/2 x 1"	SP MS	FR	FR	CS	—	—	3F, 1c	0.25		
Bw1	14	2.5YR3/1	Sil	20	3	20% ST	1/2 x 1"	SR CS	FR	FR	CS	—	—	2F	1.75		
Bw2	19	2.5YR4/1	Sil	18	3	45% ST	1/2 x 1"	PO SO	FR	FR	DS	—	—	2F, 1M	2.5		
Cr	50	5YR4/3	Sil	12	16	90% ST	1/2 - 1/4 x 1"	PO SS	FR	FR	—	—	—	—	4.5		

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Russell Rosco
 Field Assistant: Steph Horara

Signature: 

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1053

Test Pit ID:	Date:	Job Name:	RETTEW Job #:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	Parent material:	Notes							
P005-160620-1425 RLL	6/20/2016	Dominion - Atlantic Coast Pipeline Soil Survey	089962000	CTF	Mixed	Backslope 42% 40% 50"	Residuum 3520 50+ "								
						Vegetation: <u>Maple & Beech</u>	Dip Slope & Direction:	Strike:							
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (Inches)	Structure Type, Grade, and Size	Moist Consistence	Native Boundary Temperature & Direction	Redox Feature Color	Native Feature Description	Roots	Water Potential/ pH	Lab Sample ID
Oa	3	5YR 2.5/1	—	—	—	—	—	F1GR	FR	CKS	—	—	3F, 1M	4.5	
Bw	22	5YR 4/14	S1L	18	6	20% ST	1/2"	F1GR	FR	g/s	—	—	3F, 1M	2.0 5.25	
Bx	50	5YR 3/14	S1L	23	9	40% ST	3/4-1"	MISBR	FR	—	—	—	—	3.75 5.0	

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: David A. Tamm

Field Assistant: Taylor M. Miller

Signature: 

RETTEW Associates, Inc.
3020 Columbia Avenue
Lancaster, PA 17603
Phone: 717-394-3721
Fax: 717-394-1063

Test Pit ID:	Date:		Job Name:	RETTEW Job #:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	% Slope:	Drainage Class:	Depth to Refusal:	Bedrock Type:	Vegetation:	Parent material:	Slope Aspect:	Depth to Water Table:	Slope Failure or slip:	Dip Slope & Direction:	Roots	Rock Fragment Type & %	Rock Fragment Size (inches)	Structure Type, Grade, and Size	Moisture Condition	Moisture Density & Substrate	Redox Feature Color	Moisture Feature Description	Notes
2B10-100620-1509-DAT	0-20-25	0-20-25	Dominion - Atlantic Coast Pipeline Soil Survey	089962000	Catawche	Stillicidae	Rock	38%	Moderately Well Drained	N/A	N/A	Sugar Maple - 70% +	Yellowish Sandstone		N/A				XFL	2.0-18.0+	SRL	FR	SA			
2B11	0-1	2.5YR 2.5/1																	XFL	18.0+	SRL	FR	SA			
2B12	0-1	2.5YR 2.5/1																	XFL	18.0+	SRL	FR	SA			
2B13	0-1	2.5YR 2.5/1																	XFL	18.0+	SRL	FR	SA			
2B14	0-1	2.5YR 2.5/1																	XFL	18.0+	SRL	FR	SA			
2B15	0-1	2.5YR 2.5/1																	XFL	18.0+	SRL	FR	SA			
2B16	0-1	2.5YR 2.5/1																	XFL	18.0+	SRL	FR	SA			
2B17	0-1	2.5YR 2.5/1																	XFL	18.0+	SRL	FR	SA			
2B18	0-1	2.5YR 2.5/1																	XFL	18.0+	SRL	FR	SA			
2B19	0-1	2.5YR 2.5/1																	XFL	18.0+	SRL	FR	SA			
2B20	0-1	2.5YR 2.5/1																	XFL	18.0+	SRL	FR	SA			
2B21	0-1	2.5YR 2.5/1																	XFL	18.0+	SRL	FR	SA			
2B22	0-1	2.5YR 2.5/1																	XFL	18.0+	SRL	FR	SA			
2B23	0-1	2.5YR 2.5/1																	XFL	18.0+	SRL	FR	SA			
2B24	0-1	2.5YR 2.5/1																	XFL	18.0+	SRL	FR	SA			

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Dwaine A. Thayer
 Field Assistant: Taylor M. Walter

Signature: [Signature]

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	Date:	Job Name:	RETTEW Job #:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	% Slope:	Drainage Class:	Depth to Refusal:	Bedrock Type:	Vegetation:	Parent material:	Slope Aspect:	Depth to Water Table:	Slope Failure or slip:	Dip Slope & Direction:	Roots:	Moisture Content:	Moisture Consistency:	Moisture Density:	Redox Feature Color:	Redox Feature Description:	Lab Sample ID:	Notes:	
P007-160620-1245-DNA	06-20-2016	Dominion - Atlantic Coast Pipeline Soil Survey	089962000	Catawba Chemung silt loam	Silt loam	SAVINGS ROCK (BENCH)	13%	Sandy silt	N/A	N/A	Superior, Northern Red Oak, Ash	Savannah/Redwood	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
A	0-3	5 ^{1/2} L	S.L	11	16	Keil 60%	0.25- 8.10	PS SS	PS SS	SR	1.1	VFR	SA	-	-	-	2.5 4.5	5-14 5-18						Very hard to 0.25"	
Bt1	3-9	2.5 ^{1/2} 5/4	S:CL	31	11	Cl 20%	0.25- 4.0	PS SS	PS SS	SR	1.3	FR	SA	-	-	-	2.5 4.5	5-24 5-28							
Bt2	9-17	2.5 ^{1/2} 5/4	S:CL	38	8	Cl 5%	0.25- 0.5	PS SS	PS SS	SR	2.2	FR	SA	-	-	-	1.5 3.0 4.5	5-34 5-42							
Bt3	17-28	10 ^{1/2} 4/3	S:C	43	11	Cl 5%	0.25- 0.5	PS SS	PS SS	SR	2.3	FR	SA	-	-	-	3.5 4.5	5-44 5-48							
Bt4	28-44	10 ^{1/2} 4/3	S:C	40	15	Cl 10%	0.25- 0.5	PS SS	PS SS	PR	1.3	FR	SA	-	-	-	4.5 4.7	5-52 5-58						Roots only along primary	
Bt5	44-50	2.5 ^{1/2} 4/3	S:CL	33	21	Keil 85%	0.25- 2.0	PS SS	PS SS	PR	1.2	FR	-	-	-	-	3.5 4.5	5-64 5-68							

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Tuane A. Trax
 Field Assistant: Taylor Walter

Signature: 

RETFW Associates, Inc.
 3020 Calloway Avenue
 Lancaster, PA 17603
 Phone: 717-394-5721
 Fax: 717-394-1063

Test Pit ID:	Topographic Position:										Parent material:						
Date:	% Slope:										Slope Aspect:						
Job Name:	Drainage Class:										Depth to Water Table:						
RETFW Job #:	Depth to Refusal:										Slope Failure or slip:						
NFCS Soil Unit:	Bedrock Type:										Dip Slope & Direction:						
Mineralogy:	Vegetation:																
USDA																	
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Parallely Striated	Structure Type, Grade, and Size	Moist. Consistence	Moist. Consistence	Redox Feature Color	Soil Feature Description	Roots	Field Measurement/ pH	Lab Sample ID	Notes
A	0-3	5YR 4/2	SIL	8	15	KGK 40%	0.25-3.0	PO SO	GK 1/2	JK WA		-	2. F 2. M	0.25 4.5	S-14 S-13	10% Sil 20% 2.5"	
Bw1	3-12	2.5YR 4/4	SIL	11	25	WGR 5%	0.25-4.0	PO SO	SBK 1/2	JK SA		-	1. F 2. M	0.5 4.2	S-2A S-2B		
Bw2	12-26	5YR 5/4	L	13	42	XOL 65%	0.25-6.0	PO SS	SBK 1/3	FR SA		-	1. F 1. M	1.0 4.7	S-3A S-3B		
ZC	26-31	2.5YR 5/4	L	16	38	XOL 85%	0.25-10.0	PO SS	SBK 1/3	JK SA		-	1. M	1.0 4.7	S-4A S-4B		
ZR	31+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Sandstone 30% rock

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: M. WOOD J. GALBRAITH
 Field Assistant: M. DUGAN

Signature: M. Wood

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1053

Test Pit ID:	009-110620-115-MGW	Topographic Position:	SUMMIT	Parent material:	RESIDUUM											
Date:	6/20/16	% Slope:	1	Slope Aspect:	200											
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey	Drainage Class:	W/D	Depth to Water Table:	7.32											
RETTEW Job #:	08996200	Depth to Refusal:	3.2	Slope Failure or slip:	-											
NRCS Soil Unit:	CATEACATE	Bedrock Type:	SANDSTONE	Dip Slope & Direction:	22° W											
Mineralogy:	ATXCD	Vegetation:	RED MAPLE, STRIPED, SUSAN, BEECH, BL. CHERRY	USDA	338 (N 22 W)											
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Structure Type, Grade, and Size	Molt Consistence	Natural Boundary Topography & Discontinuity	Redox Feature Color	Soil Feature Description	Roots	Rock Fragmentation/PI	Lab Sample ID	Notes
De	0+1	SNR 3/2	-	-	-	-	-	-	-	AS	-	3F-VF 3M-10	4.6	-		
A	1-6	7.5 YR 2.5/1	GA SIL	10	30	GR 30	< 6"	PO SB 1 VF GR	VFR CW	CW	-	3F-VF 3M-10	0.25 4.4	-		
AB	6-13	7.5 YR 2.5/2	VE SIL	8	15	GR 35	< 6"	PO SS 1 M SBR GR	FR CS	CS	-	3F-VF 2M-10 1 VC	0.25 4.4	-		
Bw1	13-25	7.5 YR 5/6	VE SIL	12	15	GR 40	< 12"	PO SS 1 M SBK	FR CW	CW	-	3F-VF 1M-10 1 VC	1.25 5.5	-		
Bw2	25-32	7.5 YR 5/6	VE SIL	16	20	GR 45	< 12"	PO SS 1 M SBL	FI CW	CW	-	2F-VF 1M-10	1.75 5.2	-		
Cp	32+															

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: M. WOOD, J. GAUBRATH
 Field Assistant: M. DWIGAN

Signature: M. Wood

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	POID-160620-1315-MGW	Topographic Position:	SUMMIT	Parent material:	RESIDUUM	Notes										
Date:	6/20/16	% Slope:	2	Slope Aspect:	210											
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey	Drainage Class:	MWD	Depth to Water Table:	31											
RETTEW Job #:	089962000	Depth to Refusal:	40	Slope Failure or Slip:	-											
NRCS Soil Unit:	CATAWACHE	Bedrock Type:	SANDSTONE	Dip Slope & Direction:	19° ENE	Strike: 211										
Mineralogy:	MIXED	Vegetation:	See notes below													
Horizon	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Structure Type, Grade, and Size	Mollic Consistence	Moist Bulk Density (g/cm³)	Redox Feature Color	Redox Feature Description	Roots	Moist Permeability (mm)	Lab Sample ID	Notes
De	0-1	5YR 3/2	-	-	-	-	-	-	-	AS	-	-	3+ VF 2 CO-M	4.5	S1	
A	0-4	5YR 2.5/1	S1	14	8	GR 20	< 2"	PO 1 VF SD GN	VFR	CS	-	-	3 F-VF 2 CO-M	4.6	S2	
AE	4-8	7.5YR 3/2	S1	14	8	GR 15	2-2"	PO 5D SD SBK-GC	VHL	CW	-	-	3 F-VF 1 CG-M	4.8	S3	
Bt1	8-13	7.5YR 4/3	S1	19	12	GR 8	< 3"	SP 1 VF MS SBK	FR	CW	-	-	1 F-VF	5.1	S4	
Bt2	13-23	7.5YR 4/6	S1	23	15	GR 8	< 3"	SP 2 VF MS SBK	FR	CW	-	-	1 F-VF 1 CG-M	5.2	S5	
Bt3	23-31	7.5YR 5/4	S1	25	13	GR 8	< 5"	SP 2 F MS SBK	FI	CW	-	-	1 F-VF	5.1	S6	
Bt4	31-37	7.5YR 5/4	S1	26	10	GR 10%	< 5"	MP 1 M SS SBK	FI	CW	+1d	1 F-VF	3.5	S7	LITTLE ROCK SAND	
Bt5	37-44	7.5YR 5/6	S1	35	15	GR 10%	< 5"	MP 1 M MS SBK	FI	CW	+1d	-	3.5 4.8	S8	LITTLE ROCK	

Other Notes: FA + Cr

SUGAR MAPLE, BLUE OAK, RED OAK, RED MAPLE

TEST PIT DESCRIPTION

Soil Scientist: M. Wood J. GAUBRATH
 Field Assistant: M. DUGAN

Signature: M. Wood

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	<u>P011-160620-1140-M&W</u>	Topographic Position:	<u>SUMMIT</u>	Parent material:	<u>RESIDUUM</u>
Date:	<u>6/20/16</u>	% Slope:	<u>2%</u>	Slope Aspect:	<u>330°</u>
Job Name:	<u>Dominion - Atlantic Coast Pipeline Soil Survey</u>	Drainage Class:	<u>WP</u>	Depth to Water Table:	<u>728</u>
RETTEW Job #:	<u>089962000</u>	Depth to Refusal:	<u>29</u>	Slope Failure or Slip:	<u>-</u>
NRCS Soil Unit:	<u>CATEACHE</u>	Bedrock Type:	<u>SANDSTONE</u>	Dip Slope & Direction:	<u>1% -</u>
Mineralogy:	<u>MIXED</u>	Vegetation:	<u>BLUE CHERRY, STRIPED MAPLE, MAGNOLIA, BEECH, RED MAPLE,</u>	Strike:	<u>300</u>

Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Stability Index	Structure Type, Grade, and Size	Mohr Consistency	Moisture Boundary Topography & Disturbance	Redox Feature Color	Moist Feature Description	Roots	Moist Resistance/PI	Lab Sample ID	Notes
DH	0e	5YR 3/2	-	-	-	-	-	-	-	-	AB	-	-	3F-VF 2 CO-M	4.9	-	
1-3	A	7.5YR 2.5/2	GN 5.0	15	10	GN 30	< 5"	PS SS	1VF GR	VFA	CS	-	-	3F-VF 2 CO-M	0.25 4.3	-	
3-10	Bw ₁	7.5YR 3/3	GR 5.0	15	18	GL 30	< 5"	PS SS	1F SBV	FR	CI	-	-	2F-VF 1 CO-M	0.25 4.5	-	
10-24	Bw ₂	7.5YR 5/4	GR 5.0	15	18	GN 55	4.8"	PS SS	1M SBV	FR	CS	-	-	2F-VF 1 CO-M 1 VF	0.5 5.5	-	
24-28	C _r	7.5YR 5/4	GR 5.0	11	4	GR	< 12"	-	-	-	-	-	-	-	-	-	
28+	R	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Other Notes: Beech, Black Cherry, Sugar Maple, Cucumber Magnolia, Striped Maple, Fern, no varnish
Elderberry, False nettle, jewelweed

TEST PIT DESCRIPTION

Soil Scientist: M. WOOD J. GALBRAITH
 Field Assistant: M. DULAN

Signature: M. Wood

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID: PD12-12062D-1115-MGW Topographic Position: SOMMIT Parent material: COLUVIUM / RESIDUUM
 Date: 6/20/16 % Slope: 1% Slope Aspect: 12D
 Job Name: Dominion - Atlantic Coast Pipeline Soil Survey Drainage Class: WD Depth to Water Table: 27
 RETTEW Job #: 089962000 Depth to Refusal: 27 Slope Failure or Slip: -
 NRCS Soil Unit: CATEACHE Bedrock Type: SANDSTONE Dip Slope & Direction: 15.5° -
 Mineralogy: MIXED Vegetation: SEE CRUV USDA

Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Structure Type, Grade, and Size	Moist Consistence	Median Boundary Topography & Orientation	Redox Feature Color	Roots	Lab Sample ID	Notes
0-2	De	7.5YR 3/2	-	-	-	-	-	-	-	AS	-	3 F-VF 3 C-M	S1	
2-7	A ¹	7.5YR 2/1	UGR S.L.R	8	10	GR 60	< 1/2"	1 VF GR	VHR	CW	-	3 F-VF 3 C-M	S2	
7-10	Bhs	5YR 3/1	UGR S.L.R	10	10	GR 60	< 10"	1 F SBK-GA	FR	CW	-	3 F-VF 2 C-M 1 VC	S3	COMMON ADJUSTED ortsteins
10-17	B _s	5YR 3/3	UGR S.L.R	10	10	GR 50	< 12"	1 M SBK	FR	CW	-	2 F-VF 2 C-M 1 VC	S4	
17-24	BC	7.5YR 4/4	UGR S.L.R	8	11	GR 50	< 12"	1 M SBK	FR	CW	-	1 F-VF 1 C-M	S5	
24-27	Cr	7.5YR 4/4	-	-	-	-	-	-	-	-	-	-		
27	R													

Other Notes: VEG: BLACK CHERRY, STRIPED MAPLE, WITID/ HA ZEL, BEECH

TEST PIT DESCRIPTION

Soil Scientist: John Van
 Field Assistant: MIGUEL RODRIGUEZ

Signature: [Signature]

RETTEW Associates, Inc.
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 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P-022-160614-1050-JSM					Topographic Position:					Parent material:						
Date:	6/14/16					% Slope:					COLUVIUM OVER RESIDUUM						
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey					Drainage Class:					SLOPE ASPECT						
RETTEW Job #:	089962000					Depth to Refusal:					DEPTH TO WATER TABLE						
NRCS Soil Unit:	COWD-DECAR-BERKS					Bedrock Type:					DIP SLOPE & DIRECTION						
Mineralogy:	MIXED					Vegetation:					DIP SLOPE & DIRECTION						
USDA																	
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Number/Inches	Structure Type, Grade, and Size	Molt Confidence	Moist Bulk Density	Redox Feature Color	Water Feature Description	Roots	Product Development/pt	Lab Sample ID	Notes
0e	0-3	5R2.5/1	-	-	-	-	-	-	-	-	AW	-	-	3-V,F,F	-	S1	
0a	3-5	5R2.5/1	-	-	-	-	-	-	-	-	AW	-	-	3-V,F,F	-	S2	
E	5-8	5R2.5/2	GR LS	4	85	15 GR	0.5-2	PO	1M SBK	VER	AW	-	-	2-F,M	0.25	S3	
Bs	8-14	5R3/4	SL	6	75	5 GR	0.5-2	PO	1M SBK	VER	AW	-	-	2-F,M	0.5	S4	
Bk1	14-21	5R2.5/6	CH SL	16	68	25 CH	<0.5	PO	2M SBK	VER	AW	-	-	1-F,M,C	0.5	S5	SANDSTONE COE CLAY SKINS
2B2L	21-36	10R5/6	SICL	34	10	Ø	-	MP	2M SBK	VER	CS	-	-	1-F	1.25	S6	LITRACOLLOM IC CLAY SKINS
2BCL	36-55	10R5/6	SICL	29	12	1	<0.5	SP	ØMB	VER	-	-	-	Ø	2.75	S7	LITRACOLLOM IC UNDERLIES TM DUEY STRUCTURE
2C1	55-80	-	-	-	-	-	-	SS	-	-	-	-	-	-	4.7	A/B	SOFT GRAY SILTSTONE W/DECAYING FRAGMENTS

Other Notes: AVG DEEP BELOW 50" FIRM SILTSTONE BEDROCK AT 80"

TEST PIT DESCRIPTION

Soil Scientist: JENNIFER WEAVER
 Field Assistant: MIGUEL PARRALES

Signature: [Signature]

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P-0223-160614-1150-35N					Topographic Position:	BACKSCOPE											
Date:	6/14/18					% Slope:	40%											
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey					Drainage Class:	WELL											
RETTEW Job #:	089962000					Depth to Refusal:	56"											
NRCS Soil Unit:	CAVVID DEARB-BRKS					Bedrock Type:	SILTSTONE											
Mineralogy:	MIXED					Vegetation:	HICKORY MAPLE, CUSTARD OAK, WHITE PINE, BLUEBERRY											
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Rooting/soiliness	Structure Type, Grade, and Size	Mold Consistence	Natural Boundary Topography & Disturbance	Redox Feature Color	Root Pattern Description	Roots	Root Penetration/pt	Lab Sample ID	Notes	
De	0-1	5-10/5/1	-	-	-	-	-	-	-	-	as	-	-	3-VT, F ₁ M	-	-	-	↑ VFS
BE	1-5	7.5/10/5/10	GR L	14	40	15 GR	< 1	PO SO	1M/SBK	FR	CS	-	-	3-F ₁ M 2-C 1-Vc	1.0	-	-	SANDSTONE COF CLAY SKINS
DE1	5-3	7.5/10/5/10	CH SILCL	28	20	20 CH	1-3	SP SS	2M/SBK	FR	CS	-	-	2-F ₁ M 1-Vc	1.0	-	-	SANDSTONE COF CLAY SKINS
BL2	BL2 1/3-1/2	7.5/10/5/10	CH SILCL	36	18	25 CH	2-4	MP SS	2M/SBK	FR	CM	-	-	2-F 1-M	2.5	-	-	SANDSTONE COF CLAY SKINS
2C5	2C5 2/3-5/8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2R	2R Sht	SILTSTONE	BE DRCK	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Other Notes: SANDSTONE CLAYS AND STONES 36" ON SURFACE; AUGERED BELOW 50";

TEST PIT DESCRIPTION

Soil Scientist: JOHN MANN
 Field Assistant: MAYRAH PARSONS

Signature: [Signature]

RETTW Associates, Inc.
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 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1053

Test Pit ID:	T-024-160614-1440-15M	Topographic Position:	BEUCH/NOISE	Parent material:	RESIDUUM
Date:	6/14/16	% Slope:	9%	Slope Aspect:	130°
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey	Drainage Class:	WELL	Depth to Water Table:	-
RETTW Job #:	089962000	Depth to Refusal:	-	Slope Failure or slip:	-
NRCS Soil Unit:	CAVLIN - DEKALB - BERK2	Bedrock Type:	SILTSTONE	Dip Slope & Direction:	-
Mineralogy:	MIXED	Vegetation:	HARLE WHITE OAK, DEWLOCK, WHITE PINE	Strike:	-

Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (Inches)	Stoniness/ nodules	Structure Type, Grade, and Size	Molt Consistence	Moisture Retention & Distribution	Redox Feature Color	Moisture Feature Description	Roots	Rock Fragmentation/ pH	Lab Sample ID	Notes
A	0-3	10YR2/2	SIL	14	20	S CH	< 1		PO SD FR	FR	CM	-	-	3-VF 2-F	0.25	-	CLAY SKINS
Bt1	4-11	10YR5/6	SICL	38	10	qR	< 1		MP SS M M	FR F1	CM CM	-	-	2-F, M 1-C	1.25	-	CLAY SKINS
Bt2	11-18	10YR6/3	SIC	42	10	qR	< 1		MP SS M M	F1	CM	-	-	2-T, M	1.25	-	CLAY SKINS
Bc	18-36	10YR5/8	SIC	50	5	CH	< 0.5		MP SS M M	F1	CM	-	-	3.25	-	CLAY SKINS WITH OCCASIONAL DECAYING SILTSTONE	
C1	36-54	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-

Other Notes: SOME CAVILIN INDENTED IN SURFACE; AUGER BELOW 50"; SYR3/3 VE3 LENSES BEGINNING AT 64"-DECAYED INTERBEDDED SANDSTONE?

TEST PIT DESCRIPTION

Soil Scientist: John C Roberts
 Field Assistant: Taylor Walter

Signature: John C Roberts

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 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P-023-160617-0942-SCR			Topographic Position:	Lower first back slope			Parent material:	Colluvium over residuum		
Date:	6-17-2016			% Slope:	10%			Slope Aspect:	E		
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey			Drainage Class:	W0			Depth to Water Table:	—		
RETTEW Job #:	089962000			Depth to Refusal:	30			Slope Failure or slip:	—		
NRCS Soil Unit:	DrkAlb - Hazelton			Bedrock Type:	—			Dip Slope & Direction:	—		
Mineralogy:	mixed			Vegetation:	Mushroom lawn, white pine, short leaf pine, Red Maple, Red Oak, White Oak			Srike:	—		

Horizon	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture/Structure	Structure Type, Grade, and Size	Moldboard Condition	Moldboard Feature	Redox Feature Color	Redox Feature Description	Roots	Moldboard Feature/Depth	Lab Sample ID	Notes
A	3	10YR4/1	SIL	12	11	GR 10	0.25-0.5	PO 50	GR 1F	YFR	AW	—	—	200 1M	0.25	4.5	—
De	0.5	5YR2.5/1	—	—	—	GR 5	0.25-0.5	—	GR 1F	—	AW	—	—	200 1F	4.2	—	—
E	7	2.5Y4/4	SIL	12	14	GR 10	0.25-0.5	PO 50	SPK 1F	FR	CW	—	—	1f, vt 2m	1.5	4.8	—
Bw1	15	10YR5/6	SIL	15	14	GR 10	0.25-0.5	SP 55	SPK 1M	FR	CW	—	—	100 2x, vt 2f	0.75	4.8	—
Bw2	19	10YR5/6	SIL	17	14	GR 20	0.25-30	SP 55	SPK 1M	FR	CW	—	—	1f 2f	1.25	—	—
C	32	10YR6/6	GR S1	8	10	GR 65	0.25-0.5	RO 50	OM	VF1	GW	—	—	—	4.5	—	—
R	32+	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Other Notes: Horizon consists of indurated colluvium (0.25-0.5 chert & siltstone gravel)

TEST PIT DESCRIPTION

Soil Scientist: John C Roberts

Field Assistant: Taylor Walter

Signature: _____

John C Roberts

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Lancaster, PA 17603
Phone: 717-394-3721
Fax: 717-394-1063

Test Pit ID:	P-028-160617-1100-5CR			Topographic Position:	Shoulder slope									
Date:	6-17-2016			% Slope:	22%									
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey			Drainage Class:	W0									
RETTEW Job #:	089952000			Depth to Refusal:	45									
NRCS Soil Unit:	DeKalb-Hazelton			Bedrock Type:	Sandstone									
Mineralogy:	Mikv			Vegetation:	Mushroom land, Barber Maple, Black Gum, White Pine									
USDA								Notes						
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture Consistency	Moist Consistency	Moist Consistency	Redox Feature Color	Redox Feature Description	Roots	Notes
De	3	5YR 2.5/1	—	—	—	GR 1.0	GR 0.5-1.0	—	—	—	—	—	2 ft	—
A	5	10YR 4/1	L	15	40	GR 1.0 CH 0.5	GR 0.5-1.0 CH 3.0	PO	GR	VFR	AW	—	2m	0.25
E	10	10YR 5/6	L	18	40	GR 1.0	0.5-1.0	PO	GR	VFR	AW	—	1.5 ft 2.5 cm mf	0.5
Bw1	20	7.5YR 5/6	L	20	45	GR 4.0	0.5-3.0	SS	SRK	FR	CW	—	2 ft	1.50
Bw2	32	7.5YR 5/6	L	22	45	GR 5.0	0.5-4.0	SS	SRK	FR	CW	—	1m	4.5
C	45	7.5YR 5/6	SL	18	65	—	—	SS	SRK	FR	CW	—	2.5m	0.75
ZR	45	—	—	—	—	—	—	SS	SRK	FR	CW	—	—	4.4

Other Notes:

Dip Strike could not be estimated; colluvium over residue @ 45
fine ground Sandstone PM

TEST PIT DESCRIPTION

Soil Scientist: John W. Wain
 Field Assistant: Leah G. Kereciti

Signature: [Signature]

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1053

Test Pit ID:	P-031-160615-1222-33W		Topographic Position:	BARKSLOPE		Parent material:	COLUVIUM OVER RESIDUUM									
Date:	6/15/16		% Slope:	46%		Slope Aspect:	350°									
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey		Drainage Class:	WELL		Depth to Water Table:	-									
RETTEW Job #:	089962000		Depth to Refusal:	32"		Slope Failure or slip:	-									
NRCS Soil Unit:	MICKERT		Bedrock Type:	SILTSTONE		Dip Slope & Direction:	75°SE (30°) Strike: 220°									
Mineralogy:	MIXED		Vegetation:	WHITE OAK, WHITE PINE, HICKORY, HEMLOCK		USDA										
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (Inches)	Structure Type, Grade, and Size	Moist Consistence	Uniform Boundary Distribution	Redox Feature Color	Median Feature Description	Roots	Parent Fragmentation/ in	Lab Sample ID	Notes
Oe	0-2	5-R2.5/1	-	-	-	-	-	-	-	-	-	-	3-VF 2-F	4.2	-	
A	2-5	5-SFR2.5/1	SIL	12	18	5 gr	< 0.5	1-FR	VER	CM	-	-	2-VF, F 1-M	4.3	-	
BA	5-5	5-SFR2.5/1	SIL	14	15	10 CH	< 1	1-M, 50K	VER	CM	-	-	3-F 2-M, C	4.5	-	
Bw	5-10	5-SFR5/4	SIL	17	15	40 CH	1-3	2-M, 50K	FER	CM	-	-	2-F, M 1-C, M	4.5	-	
Bc	10-19	5-SFR5/4	SIL	22	17	70 CH	2-4	4-50K	FER	CM	-	-	1-F, M	1.0	-	
2C1	20-30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	LITHOCHROMIC
2R	32+	SILTSTONE	BEDROCK													

Other Notes: DECKSCORE - LINEAR UNWEAR

TEST PIT DESCRIPTION

Soil Scientist: Jared W. W. W.
 Field Assistant: Jared W. W. W.

Signature: Jared W. W. W.

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P-032-160415-1215-01W					Topographic Position:	BARKS CREEK / NOISE										
Date:	6/15/16					% Slope:	22%										
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey					Drainage Class:	WET										
RETTEW Job #:	089962000					Depth to Refusal:	34"										
NRCS Soil Unit:	W E I K E R T					Bedrock Type:	Siltstone										
Mineralogy:	M I X E D					Vegetation:	White pine, white oak, hop hornbeam, hickory, red maple										
USDA																	
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Number/ Substrata	Structure Type, Grade, and Size	Mollic Condition	Hydroic Boundary Topography & Orientation	Redox Feature Color	Bedrock Feature Description	Roots	Field Penetration/ M _d	Lab Sample ID	Notes
0e	0-1.5	5YR2.5/1	-	-	-	-	-	-	-	-	as	-	-	3-VF	4.5	-	
A	1.5-2	10YR3/1	SIL	12	15	10 GR	< 1	po	1 FBR	NFR	am	-	-	3-VK, F	0.25	-	
Bw	2-10	10YR5/6	CH SIL	17	10	15 CH	0.5-2	SP	1 FBR	FR	cm	-	-	3-VK, F 1-C, VC	1.0	-	
Bc	10-14	10YR5/4	SIL	15	15	5S CH	1-2	so	1 FBR	FR	cm	-	-	2-VF 1-C	4.5	-	LITNORIC
2Bc	14-20	2.5Y5/4	XCH SIL	23	10	60 CH	1-2	SP	1 FBR	FR	cm	-	-	2-E 1-C	-	-	
2Cr	20-34	-	-	-	-	-	-	SS	-	-	-	-	-	-	-	-	
2R	34+	SILTSTONE	-	-	-	-	BED ROCK	-	-	-	-	-	-	-	-	-	

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: JOHN WELLS
 Field Assistant: JOHN GERRARD

Signature: [Signature]

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	Date:	Job Name:	RETTEW Job #:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	% Slope:	Drainage Class:	Depth to Refusal:	Bedrock Type:	Vegetation:	Parent material:	Slope Aspect:	Depth to Water Table:	Slope Failure or Slip:	Dip Slope & Direction:	Roots:	Profil Temperature/ft	Lab Sample ID	Notes	
P-033-160615-1041-JSW	6/15/16	Dominion - Atlantic Coast Pipeline Soil Survey	089962000	NEIKSET	MIXED	BACKSLOPE - CEDX	18%	MODERATELY WELL			SLTSTONE	COLLUVIUM OVER RESIDUUM	1620	311'			2-VE, F	4.5			
A	1-3	10/PR3/1		SIL													2-F, M	0.25			SANDSTONE COG
AB	3-5	10/PR3/1A		SIL													1-C	4.5			SANDSTONE COG
Bt1	5-10	2.5/RS/10		CH SIL													1-M	4.5			CLAY SILTY SANDSTONE COG
Bt2	10-31	2.5/RS/10		CH SIL													2-E	1.5			CLAY SILTY SANDSTONE COG
Bt3	50	10/RS/16		CH SIL																	

Other Notes: UNDER COVERAGE - JOHN EVIDENCE

TEST PIT DESCRIPTION

Soil Scientist: David Ward
 Field Assistant: David Ward

Signature: [Signature]

RETTW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID: P-034-160615-1019-35W Topographic Position: Backslope Parent material: Colluvium over Residuum
 Date: 6/15/16 % Slope: 20% Slope Aspect: 250°
 Job Name: Dominion - Atlantic Coast Pipeline Soil Survey Drainage Class: well Depth to Water Table: 244"
 RETTEW Job #: 089962000 Depth to Refusal: 44" Slope Failure or slip: -
 NCRS Soil Unit: WE1KCKT Bedrock Type: Siltstone Dip Slope & Direction: 62° 110° Strike: 20°
 Mineralogy: Mixed Vegetation: Scarlet oak, Chestnut oak, White Hazel, White Pine

Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	USDA		Moist Consistence	Mollic Boundary Topography & Description	Redox Feature Color	Major Feature Description	Roots	Pocket Penetration/ pH	Lab Sample ID	Notes	
								Stability/ Substrata	Structure Type, Grade, and Size									
De	0-3	5R2.5/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A	3-5	10R2.5/1	SIL	13	15	12 CH	<2	Po	1EPR	V-R	aw	-	-	3vf-vc	4.5	-	-	
								so	1EPR	aw	-	-	3vf-vc	0.25	-	-		
BE	5-15	10R2.5/6	SIL	16	18	17 CH	<3	Po	1EPR	V-R	aw	-	-	2vf-f	0.5	-	-	-
								so	1EPR	V-R	aw	-	-	3m-vc	4.5	-	-	
2Bt	15-31	10R2.5/6	SIL	32	10	2S CU 15 GR	1-4 <1	MP	2M1BK	FR	aw	-	-	2vf-m	0.5	-	-	-
								so	2M1BK	FR	aw	-	-	2vf-m	4.5	-	-	
2C	31-38	10R2.5/6	SIL	20	12	8S CH	0.5-5	-	0ND	FR	aw	-	-	2f-m	-	-	-	-
								-	0ND	FR	aw	-	-	2f-m	-	-	-	-
2Cr	38-44	-	-	-	-	-	-	-	-	-	-	-	-	1f-m	-	-	-	-
								-	-	-	-	-	-	1f-m	-	-	-	-
2R	44+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
								-	-	-	-	-	-	-	-	-	-	-

Other Notes: SOME EVIDENCE OF BURDING ON SURFACE

TEST PIT DESCRIPTION

Soil Scientist: Dierk Stenzel (Machor)
 Field Assistant: Scott Walsh

Signature: Dierk Stenzel

RETTW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	R-035-160(015-1011-DEF			Topographic Position:	Ridge top over Shallow			Parent material:	residual m							
Date:	10/15/16			% Slope:	3%			Slope Aspect:	218°							
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey			Drainage Class:	11 / 150 HEMLOCK EXCESS			Depth to Water Table:	> 3'							
RETTW Job #:	089962000			Depth to Refusal:	23			Slope failure or slip:	-							
NRCS Soil Unit:	Vc1 Vert (WED)			Bedrock Type:	Shale - Tan			Dip Slope & Direction:	36° E							
Mineralogy:	MIXED			Vegetation:	Cherries, oak, white pine, white oak, red maple, hop horn beam			USDA								
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture/Structure	Molar Consistence	Moisture Boundary Topography & Orientation	Redox Feature Color	Moist Feature Description	Roots	Moisture Parameters/ pH	Lab Sample ID	Notes
D	0-1	5YR 2.5/1	Silt	15	4	-	-	-	-	-	-	-	3-VT	4.5	-	
A	1-2	10YR 3/1	Silt	12	16	5 gr	< 1	TO	-	1FGR	-	-	3-VF	< 0.25	-	
Bw	2-10	10YR 5/6	CH SAL	18	15	15 CH gr	1	SP	FR	2M	-	-	3-E	0.5	-	
Cc	10-14	-	-	-	-	-	< 0.5	SS	-	1M1BK	-	-	2-M	4.3	-	
R	14-23	SHALE	BEDROCK	-	-	-	-	-	-	-	-	-	F-F,M	-	-	

Other Notes: SUMMIT, NARROW RIDGE CREST

TEST PIT DESCRIPTION

Soil Scientist: John C Roberts
 Field Assistant: Taylor Walter

Signature: _____

John C Roberts

RETTW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P-036-160615-1557-02R				Topographic Position:	Back slope		Parent material:	Coll / Road								
Date:	6-15-2016				% Slope:	220/0		Slope Aspect:	3190								
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey				Drainage Class:	WD		Depth to Water Table:	-								
RETTEW Job #:	089962000				Depth to Refusal:	28		Slope Failure or slip:	-								
NRCS Soil Unit:	Wetshub				Bedrock Type:	Silt Stone		Dip Slope & Direction:	10°								
Mineralogy:	Mixed				Vegetation:	Witch Hazel, White Pine, White Oak, Red Maple		Strike:	131								
USDA																	
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture/Structure	Structure Type, Grade, and Size	Molt Consistence	Nation Boundary Temperature & Disturbance	Redox Feature Color	Parent Feature Description	Roots	Rocker Resistance/ pH	Lab Sample ID	Notes
0e	1	5YR 2.5/1	—	—	—	10	0.5-1.0	—	GC 1P	vf	Aw	—	—	Zvf, f	4.2	—	—
A	2	10YR 4/2	S1	10	12	20 CH	0.5-2.0	—	GR 1A	vfr	Aw	—	—	1vf, f 2v	0.25 4.5	—	—
Bw1	12	10YR 6/6	S1C	15	14	30 CH	0.5-3	—	SP 35	FR	CW	—	—	1m, vvf 2D	1.5 4.6	—	—
Bw2	23	10YR 5/6	S1C	17	12	65 VCH	1-3	—	SP 55	FR	CW	—	—	2cm 1vf	2.25 4.5	—	—
2R	23+																

Other Notes:

Horizon diagnostic to 28"
 Coll / Residium @ 23"

221

TEST PIT DESCRIPTION

Soil Scientist: John Roberts
 Field Assistant: Taylor Walter

Signature: John C Roberts

RETTEW Associates, Inc.
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 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P-037-160615-1532-5CR				Topographic Position:	Summit		Parent material:	Residuum				
Date:	10/13/16				% Slope:	5%		Slope Aspect:	46°				
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey				Drainage Class:	WD		Depth to Water Table:	-				
RETTEW Job #:	089962000				Depth to Refusal:	11		Slope Failure or slip:	-				
MRC5 Soil Unit:	Wellert				Bedrock Type:	Siltstone		Dip Slope & Direction:	25°				
Mineralogy:	M.xcd				Vegetation:	White Pine, Black Gum, White Oak, Stripe Maple, Vaccinium sp							
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (Inches)	Moisture/Structure	Structure Type, Grade, and Size	Moist Consistence	Soil Behavior & Description	Redox Feature Color	Notes
De	1	5YR2.5/1	—	—	—	CH 10	0.25-1.0	—	GR 1F	WDP	AW	—	zvf, f
A	2	10YR 3/2	SIL	14	12	CH 10	0.25-1.0	—	GR 1F	FR	CW	—	zvf, f
Bw	11	10YR 5/6	VCH SIL	14	13	CH 40	1-3.0	SP 9S	GR 1F	FR	AW	—	zvf, f
R-	11												
R													

Other Notes: Redrock fractures into flags

TEST PIT DESCRIPTION
 Soil Scientist: John C Roberts
 Field Assistant: Taylor Walter

Signature: John C Roberts

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1053

Test Pit ID:	Date:	Job Name:	RETTEW Job #:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	% Slope:	Drainage Class:	Depth to Refusal:	Bedrock Type:	Vegetation:	Parent material:	Slope Aspect:	Depth to Water Table:	Slope Failure or slip:	Dip Slope & Direction:	Rock Fragment Size (inches):	Rock Fragment Type & %:	% clay	% sand	Texture Class	Matrix Color	Depth in Inches	Horizon	Notes	
P-038-160615-1455-5CR	6-15-2016	Dominion - Atlantic Coast Pipeline Soil Survey	089962000	Wickert	Mixed	Lower Backslope	44	W0	30	Silt stone	White Pine, Chestnut oak, Red Maple	Coll / Residuum	121°	—	—	125° SE	—	—	—	—	—	—	—	—	—	—
																	0.5-1.0	CH 15	—	—	—	5YR2.5/1	2	Oe		
																	0.5-2.0	CH 15	14	10	CH 5/16	10YR 3/2	4	A		
																	0.5-3.0	CH 60	17	15	VCH 5/16	7.5YR 5/6	12	Bu1		
																	1-4.0	CH 65	22	20	VCH	7.5YR 5/6	16	Bu2		
																	1-8	CH 95	—	—	—	7.5YR 5/6	26	2R		

Other Notes: Coll / Residuum breaks @ 16

TEST PIT DESCRIPTION

Soil Scientist: John C Roberts

Signature: John C Roberts

Field Assistant: Taylor Walter

RETTEW Associates, Inc.
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 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1053

Test Pit ID:	<u>0-039-160615-1344-500</u>	Topographic Position:	<u>Shoulder</u>	Parent material:	<u>Cell Res</u>
Date:	<u>6-15-2010</u>	% Slope:	<u>24 W/D</u>	Slope Aspect:	<u>280°</u>
Job Name:	<u>Dominion - Atlantic Coast Pipeline Soil Survey</u>	Drainage Class:	<u>40</u>	Depth to Water Table:	
RETTW Job #:	<u>08996200</u>	Depth to Refusal:	<u>Sands tone</u>	Slope Failure or slip:	
NRCS Soil Unit:	<u>Melkrt</u>	Bedrock Type:	<u>White pine</u>	Dip Slope & Direction:	<u>20° N19</u>
Mineralogy:	<u>Mixed</u>	Vegetation:	<u>Black gum Vaccinium sp., chestnut oak</u>	Strike:	<u>9</u>
USDA					

Horizon	Depth in inches	Matrix color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Structure Type, Grade, and Size	Molar Consistency	Mollic Boundary Temperature & Disturbance	Redox Feature Color	Redox Feature Description	Roots	Mollic Permeability/ pH	Lab Sample ID	Notes
De	1	5YR 2.5/1				GR 10	0.25-1.0	GR 1F	FR	CW			Zwf			
A	3	10YR 3/2	S1	11	8	CH 15	0.5-1.0	GR 1F	FR	CW			Zwf	0.5		
Bw1	11	10YR 6/6	S1C	13	10	CH 25	0.5-2.0	SOK 1m	FR	CW			ZFm 100	1.25		
Bw2	19	10YR 5/6	S1C	15	12	CH 50	0.5-4.0	SOK 1m	FR	6w			ZFm 25m	2.0		
Zcr	40															
2R	40+															

Other Notes: Colluvium / Residium @ 170

TEST PIT DESCRIPTION

Soil Scientist: John C Roberts
 Field Assistant: Taylor Walter

Signature: John C Roberts

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID: P-040-1601015-1119-5CR Topographic Position: Concave Backslope
 Date: 6-15-2016 % Slope: 2 to 6%
 Job Name: Dominion - Atlantic Coast Pipeline Soil Survey Drainage Class: WD
 RETTEW Job #: 089962000 Depth to Refusal: —
 NRCS Soil Unit: Wekiverts Bedrock Type: Silt Stone
 Mineralogy: Mixed Vegetation: Red Maple, White Pine, Chestnut Oak, Hog Penhain

Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (Inches)	Structure Type, Grade, and Size	Moist Consistence	Moist Consistence	Redox Feature Color	Redox Feature Description	Roots	Parent Material:	Slope Aspect:	Depth to Water Table:	Slope Failure or Slip:	Dip Slope & Direction:	Lab Sample ID	Notes
De	1	T5YR 7/2	7/2	—	—	GR 10	0.25-1.0	GR 1.0	FR	Aw	—	—	2vf	Coll / Res	35%	—	—	—	S1	
A	3	10YR 8/2	10	11	—	GR 10	0.25-1.0	GR 1.0	VFR	Aw	—	—	2vf 1.0	—	—	—	—	—	S2	
Bw1	10	10YR 6/10	8/10	16	10	GR 15	0.5-1.0	SBk 1.5	FR	CW	—	—	2m 1.0	—	—	—	—	—	S3	
Bw2	17	10YR 5/6	GR 8/10	19	11	GR 15	0.5-2.0	SBk 1.0	FR	CW	—	—	2m	—	—	—	—	—	S4	
Bw3	25	10YR 5/6	SIL	20	12	GR 35	0.5-2.0	SBk 1.0	FR	GW	—	—	1.0m, 1.0	—	—	—	—	—	S5	
Bc	42	10YR 5/8	SIL	17	10	GR 40	2-6	SS 0.075mm, SP 0.075mm	FI	GW	2YR 7/3, 10YR 7/3, 10YR 7/3	1m, 1m, 2m	1vf	—	—	—	—	—	—	
Cr	50"	Cr											0							

Other Notes:

Large gravel + stones 22-37" Cr mostly soft silt stone with some voids
Dip + strike could not be estimated
Make 10% bypass so BC w/ trace properties

TEST PIT DESCRIPTION

Soil Scientist: John C Roberts

Field Assistant: Taylor Walter

Signature: John C Roberts

RETTW Associates, Inc.
3020 Columbia Avenue
Lancaster, PA 17603
Phone: 717-394-3721
Fax: 717-394-1063

Test Pit ID:	Date:	Job Name:	RETTEW Job #:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	% Slope:	Drainage Class:	Depth to Refusal:	Bedrock Type:	Vegetation:	Parent material:	Slope Aspect:	Depth to Water Table:	Slope Failure or slip:	Dip Slope & Direction:	Roots	Parent Resistance/ pH	Lab Sample ID	Notes
P-041-160614-1453-5CR	6-14-2016	Dornton - Atlantic Coast Pipeline Soil Survey	089962000	Wetzel	Wetzel	Summit	18	W0	23+	4	Red Maple, White Pine, Hop hounsbaw, Hickory	Red stone Residuum	SE	—	—	250 SE	—	—	—	7.5 YR 5/8 + 10 YR 7/1 Silt Stone
De	0.5	5 YR 2.5/1	—	GR	10	0.25-1.0	—	GR	IF	—	AW	—	—	—	—	—	3 v F	—	—	—
A	1.0	10 YR 4/2	—	GR	10	0.25-1.0	—	GR	1M	—	FR CW	—	—	—	—	—	3 F	0.5	—	—
BM	7	10 YR 6/6	—	GR	20	0.5-1.5	—	SBK	1M	—	FR CW	—	—	—	—	—	2 f.m	1.0	—	—
BM	14	10 YR 5/8	—	VEH	40	0.5-3.0	—	SBK	2M	—	FI	—	—	—	—	—	2 f.m	2.0	—	—
2CR	23	10 YR 7/8	—	VEH	85	1-6.0	—	SP	—	—	GW	—	—	—	—	—	1 v F	4.2	—	—
2R	23+	—	—	—	—	—	—	SP	—	—	—	—	—	—	—	—	—	—	—	—

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Sohne Roberts
 Field Assistant: Taylor Walter

Signature: [Signature]

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	Date:	Job Name:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	Parent material:	Notes										
P-042-160614-1355-5CR	6-14-2016	Dominion - Atlantic Coast Pipeline Soil Survey	WEIKERT	Mixed	Concave head slope	Call to Residuum											
					% Slope: 34	Slope Aspect: 227°											
					Drainage Class: WD	Depth to Water Table:											
					Depth to Refusal: 39	Slope Failure or slip:											
					Bedrock Type: Red silt stone	Dip Slope & Direction: 15° S											
					Vegetation: White Pine, Black Gum, Hickory, White Oak	Strike: 50°											
USDA																	
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (Inches)	Moisture/ Stability	Structure Type, Grade, and Size	Moist Consistence	Hydrophobic Potential	Redox Feature Color	Root Features Description	Roots	Rock Fragmentation/ pit	Lab Sample ID	Notes
0e	1	5YR 2.5/2	—	—	—	15 GR	0.5-2.0	—	GR 1F	—	—	—	2vF	4.2	—	—	
A	3	10YR 4/2	S1	12	10	20 GR	0.5-2.0	—	GR 1M	VFR	Cw	—	2vF 2m, F 1, 2D	0.1	—		
														4.8	—		
BE	7	10YR 6/6	S1L	15	15	20 GR	0.25-2.0	—	SBK 1M	FR	Cw	—	2m, F	0.1	—		
														4.5	—		
Bu1	13	10YR 5/6	S1L	18	16	20 GR	0.25-1.0	—	SBK 1M	FR	Cw	—	2m, F	0.5	—		
														4.5	—		
Bu2	18	10YR 5/6	S1L	18	16	45 VGR	0.5-2.0	—	SBK 1m	FR	Cw	—	2F	0.75	—		
														4.5	—		
ZB1	26	10YR 5/8	S1L	24	14	60 VCH	1-4.0	—	SBK 2m	F1	Cw	—	1m, vF	1.25	—		
														4.6	—		
ZC1	39	10YR 5/8	S1L	20	15	85 VCH	1-6.0	—	Rock cont. 1m	—	GW	—	1vF	—	—		
														—	—		
ZR	39+																

Other Notes: Siltstone parent material, 75% R 5/6 + 10YR 7/1

Soft silt stone
 10YR 7/1, clay R/lms
 Eros between
 rock

TEST PIT DESCRIPTION

Soil Scientist: John C Roberts
 Field Assistant: Taylor Walter

Signature: _____

John C Roberts

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	Date:	Job Name:	RETTEW Job #:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	% Slope:	Drainage Class:	Depth to Refusal:	Bedrock Type:	Vegetation:	Parent material:	Slope Aspect:	Depth to Water Table:	Slope Failure or slip:	Dip Slope & Direction:	Roots	Moisture Equivalent/ pH	Lab Sample ID	Notes	
P-043-160614-1317-50R	6-14-2016	Dominion - Atlantic Coast Pipeline Soil Survey	089962000	Welfert	Mixed	Back slope	5%	WD	30	Silt stone	White Pine, Red Oak, White	40° Residuals	4°	-	-	420 NE	4.5	-	-	-	
A	4	10YR 3/3	SIL	14	12	25 GR	0.25-1.0	PO	50	GR	1M	VFR	CW	-	2vf	2m	0.25	4.75	-	-	
Be	9	10YR 6/6	SIL	10	14	25 GR	0.25-1.0	SD	55	Silt	1M	FR	CW	-	2f	2m	1.25	4.75	-	-	
Bw1	15	10YR 5/6	SIL	17	15	15 GR	0.25-0.75	SP	55	Silt	1M	FR	CW	-	100 2vf, f, m	2m	1.25	4.75	-	-	
2Bt	20	10YR 7/8	SIL	21	14	35 GR	1.0	SD	55	Silt	2m	FR	CW	-	1m 2f	2m	2.25	4.5	-	-	
2Cr	30	10YR 5/8	SIL	20	15	95 WD	2-8	-	-	Rock	Controlled	-	CW	-	1vf	-	-	-	-	-	Silt stone
2R	30+																				

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: John C Roberts
 Field Assistant: Taylor Walter

Signature: _____



RETTW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	Date:	Job Name:	RETTEW Job #:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	Parent material:	Soil / Bedrock:	Notes								
P-044-100614-1214-52R	6-14-2016	Dominion - Atlantic Coast Pipeline Soil Survey	089962000	Wachest	Mixed	concave / hard slope	Slope Aspect: 27	254									
						Drainage Class: 42	Depth to Water Table:										
						Depth to Refusal: Bed SH slope	Slope Failure or slip:										
						Bedrock Type: With HORIZ, Chestnut Oak Hickory white Pine	Dip Slope & Direction: 30° SE										
						Vegetation:		Strike: 26°									
Horizon	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture/ Structure	Structure Type, Grade, and Size	Moist Consistency	Moisture Boundary Temperature & Direction	Redox Feature Color	Moisture Transition	Roots	Product (moisture/ per cent)	Lab Sample ID	Notes
Oe	05	5YR2.5/1				GR 10	0.5-1.0		GR 1F	—	AW	—		1 v f, f	4.2	S1	
A	1.0	10YR4/1	S1L	15	10	S GR	0.25-0.5		GR 1F	FR	AW	—		1 v f	0.25	S2	
															4.5		
															4.7	S3	
BE	7	10YR6/6	S1L	15	10	GR	0.25-1.0		S BK 1F	FR	CW	—		2f	0.5	S4	
															4.7		
Bw1	15	10YR5/6	S1L	19	12	GR 20	0.5-2.0		S BK 2F	FR	CW	—		1 v f	0.5	S4	
															4.7		
Bw2	25	10YR5/6	S1L	19	12	GR 35	0.5-3.0		S BK 2F	FR	CW	—		2m	0.7	S5	
															4.7		
															0.7		
Z Bt1	36	10YR5/8	S1L	28	18	CN 50	1-3.0		S BK 2m	FR	CW	—		f	1.25	S6	Clay Films
															4.8		
															1.25		
															4.8		
Z Bt2	42	10YR5/8	S1L	27	16	CH 40	2-3.0		S BK 2m	FR	CW	—		1f	1.0	S7	Clay Films
															4.6		
															1.0		
															4.6		

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: John C Roberts
 Field Assistant: Taylor Walter

Signature: _____

John C Roberts

RETEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	Date:	Job Name:	RETEW Job #:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	% Slope:	Drainage Class:	Depth to Refusal:	Bedrock Type:	Vegetation:	Parent material:	Slope Aspect:	Depth to Water Table:	Slope Failure or slip:	Dip Slope & Direction:	Roots	Rock Fragmentation/Type & %	Rock Fragment Size (Inches)	Structure Type, Grade, and Size	Moist. Consistence	Redox Feature Color	Redox Feature Description	Lab Sample ID	Notes
P-045-160614-1019-TCR	6-14-2016	Dominion - Atlantic Coast Pipeline Soil Survey	089962000	Wpikert	Mixed	Servey / Ridge Top	22%	SED			Silt Stone	Coll / Res				150 E	3F	CH	0.5-1.0	GR	-	-		S1	
A	2.5	10YR3/3															2F	CH	0.5-1.25	GR	WFR	CW		S2	
BA	6	10YR5/4															3F	VEH	0.5-4.0	SBK	FR	CW		S3	
Bw	10	10YR5/6															2m	MCA	1-4.0	SBK	FR	CW		S4	
Cr	50	10YR5/6															100	ECH	2-8	Rock	-	-			Silt stone few fines

Other Notes:

Silt stone in Cr, situated nearly horizontal; very few roots

TEST PIT DESCRIPTION

Soil Scientist: D. Fenderson
 Field Assistant: Max Dugan

Signature: [Handwritten Signature]

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P-0410-1056-DEF		Topographic Position:	Blunder		Parent material:	Po siltum									
Date:	10/14/16		% Slope:	25		Slope Aspect:	259°									
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey		Drainage Class:	well		Depth to Water Table:	-									
RETTEW Job #:	089962000		Depth to Refusal:	27"		Slope Failure or slip:	-									
NRCS Soil Unit:	Vertic (CWD)		Bedrock Type:	fine grained sandstone		Dip Slope & Direction:	17° E									
Mineralogy:	Mixed		Vegetation:	chestnut oak, hickory, blueberry, white pine, Red maple		Strike:	40									
USDA																
Horizon	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Structure Type, Grade, and Size	Molt Consistence	Moisture Regime	Redox Feature Color	Root Feature Description	Roots	Root Penetration/ft	Lab Sample ID	Notes
0a	0-1	5-12 2-5.1	-	-	-	-	-	-	-	AW	-	-	3+	-	-	-
A	1-1.25	10YR 2.5R	S.2	16	25	20% CN	2-2"	2Mgn	Vfr	AW	-	-	3+	0.5	-	-
AB	1.25-1.0	10YR 4.5R	S.2	16	25	80% GM	2-2"	Po	VF-	CW	-	-	3+	0.75	-	-
								Sb					4.8	-	-	
BCw	1.0-1.3	10YR 6.5Y	S.2	18	20	40% CN	2-3"	Sf	FR	CW	-	-	3+	1.25	-	-
								as					4.8	-	-	
Bwd	1.3-1.9	10YR 6.5Y	S.2	18	10	75% CN	1/2-4"	Sf	FR	CW	-	-	2f,m	2.25	-	-
								as					4.8	-	-	
CR	1.9-2.7	-	Soft shale	-	-	-	-	-	-	AW	-	-	-	-	-	-
								-					-	-	-	
QR	2.7+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: D. Fendley-Machner

Field Assistant: Max Dugan

Signature: _____

[Handwritten Signature]

RETTEW Associates, Inc.
3020 Columbia Avenue
Lancaster, PA 17603
Phone: 717-394-3721
Fax: 717-394-1063

Test Pit ID:	P-047-160019-1045-DEF			Topographic Position:	Headstone Bully			Parent material:	Colluvium							
Date:	10/19/16			% Slope:	37%			Slope Aspect:	050							
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey			Drainage Class:	Well Drained			Depth to Water Table:	-							
RETTEW Job #:	089962000			Depth to Refusal:	-			Slope Failure or slip:	-							
NRCS Soil Unit:	PdkLBSF			Bedrock Type:	-			Dip Slope & Direction:	-							
Mitralogy:	mixed			Vegetation:	Grassland			USDA								
Horizon	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Structure Type, Grade, and Size	Moist Consistence	Soil Boundary Type, Topography & Drainage	Redox Feature Color	Water Feature Description	Roots	Rock Fragmentation/pt	Lab Sample ID	Notes
De	0-1	5YR 2.5/1	-	-	-	-	-	-	-	AW	-	-	3F 2M	-	S1	
A	1-5.5	10YR 7/3	SIL	23	18	40% GR	2 1/2"	2M GR	VF	CW	-	-	3E 2C	0.2	S2	
Bw1	5.5-17	7.5YR 5/3	SIL	23	18	40% CN	1 1/2"	1.5 BK	Ff	CW	-	-	3E 2C	2.25	S3	
Bw2	17-25	7.5YR 5/4	SIL	24	18	38% GR	2 1/2"	1M BK	Ff	CW	-	-	2F 1M	3.25	S4	
Bw3	25-44	7.5YR 5/3	SIL	25	18	40% GR	2 1/4"	1.6 BK	Ff	CW	-	-	1M 1F	8.25	S5	
Bw4	44-50+	7.5YR 5/4	SIL	26	12	15% GR	2 1/2"	1.0 BK	Fp	-	7.5YR 5/10	CD	3F	3.75	S6	
											10YR 6/2	CP		4.0		

Other Notes: Several different colluvial deposits

TEST PIT DESCRIPTION

Soil Scientist: D. Ferknermacher
 Field Assistant: Max Dungen

Signature: _____



RETTEW Associates, Inc.
 3020 Columbia Avenue
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Test Pit ID:	PO48-1000014-1035-DEF		Topographic Position:	Bare slope (mid)		Parent material:	Colluvium over residuum											
Date:	6/14/10		% Slope:	37%		Slope Aspect:	180°											
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey		Drainage Class:	We II		Depth to Water Table:	-											
RETTEW Job #:	089952000		Depth to Refusal:	21"		Slope Failure or slip:	-											
NRCS Soil Unit:	Be1E4 GFD		Bedrock Type:	Sandstone		Dip Slope & Direction:	20° SE											
Mineralogy:	Mixed		Vegetation:	Chestnut Oak hophornbeam, Striped maple, White snake root		Strike:	90°											
USDA																		
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Reaction/soiliness	Structure Type, Grade, and Size	Mollic Consistence	National Boundary Topography & Slopeclass	Redox Feature Color	Redox Feature Description	Roots	Rock Fragmentation at	Lab Sample ID	Notes	
OR	0-2	5YR 2.5/1	-	-	-	-	-	-	-	-	-	-	-	3E 2m	4.9	-		
A	2-10.25	10YR 2/1	Sil	16	18	30% CN	2.7"	2E	2E5BK	Vfr	CW	-	-	3Fm 1Co	0.1 4.7	-	Mixed col frags	
AB	10.5-10.5	10YR 3/3	Sil	10	16	40% GfR	2.7"	P0 50	1E5BK	Vfr	CW	-	-	3Mf 2Mf 2Co	0.1 4.9	-		
Bw	10.5-18	10YR 5/3	Sil	18	14	40% GfR	2.7"	50 95	1M5BK	Fr	CW	-	-	2Mf 1Co	0.5 5.0	-	Rounded cifer round of 8mgnity rounded colluvium	
2BL	18-21	10YR 4/3	Sil	18	12	30% CN	4.4"	9P 95	1G5BK	Fr	AW	-	-	1C	2.75 4.8	-	Angular GfR - Residuum	
2R	21+																	

Other Notes: PM1-Colluvium PM2+3 Residuum

TEST PIT DESCRIPTION

Soil Scientist: D. Fenstermaker

Signature: Daniel Fenster

Field Assistant:

RETTEW Associates, Inc.
3020 Columbia Avenue
Lancaster, PA 17603
Phone: 717-394-3721
Fax: 717-394-1063

Test Pit ID:	P-049-1001014-1025-DEF				Topographic Position:	low backslope		Parent material:	colluvium over residual								
Date:	10/14/10				% Slope:	45°		Slope Aspect:	225° 210°								
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey				Drainage Class:	well		Depth to Water Table:	-								
RETTEW Job #:	089962000				Depth to Refusal:	49'		Slope Failure or slip:	-								
NRCS Soil Unit:	BRLS (BSE)				Bedrock Type:	Shale & siltstone		Dip Slope & Direction:	19° E								
Mineralogy:	BRLS mixed				Vegetation:	Decid. white oak, sugar maple, Christmas tree.		Strike:	281°								
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Structure Type, Grade, and Size	Molt Consistence	Moisture Boundary Conditions	Redox Feature Color	Redox Feature Description	Roots	Moist Permeability/porosity	Lab Sample ID	Notes	
De	0-2	5YR 2.5/1	-	-	-	-	-	-	-	-	-	-	35	-	-	S1	few sub-stones
A	2-4	10YR 2/2	SIL	15	20	25 GR	4 1"	PO	145 BR	VF	AW	-	35M 200	0.25 4.5	52		
Bu	4-20	7.5YR 5/3	SIL	18	23	50.1 GR	4 1"	SP SS	1M5 BR	FR	CW	-	24M 100	0.75 5.7	53		
Bu	20-32	10YR 4/4	SIL	18	23	43.1 GR	1/8-3"	PO	105 BR	FR	CW	-	24 1M	1.00 5.6	54	Ascidia and remora Callunium	
2Cr	32-35	2.5Y 5/1 10YR 5/1 10YR 5/1 10YR 5/1	SIL	18	12	55.1 CW	2 4"	PO PO	0M	FR	AW	-	-	-	-		Soft weathering Shale with fragments of Callunium
2R1	35-39	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
3R2	39+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Other Notes:

S.11stene BR: does not have a consistent bedding plane, Dip measured off overlying shale BR
R1 = shale 3R2 = s.11stene

TEST PIT DESCRIPTION

Soil Scientist: D. Fenstermaker
 Field Assistant:

Signature:



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 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P-050-1100014-1015-DEF		Topographic Position:		M.D. Backslope		Parent material:		Colluvium over Residuum								
Date:	01/11/16		% Slope:		55%		Slope Aspect:		280								
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey		Drainage Class:		Well		Depth to Water Table:										
RETEW Job #:	089962000		Depth to Refusal:		35"		Slope Failure or slip:										
NRCS Soil Unit:	Bekks (BFD)		Bedrock Type:		S. HS krk - tan		Dip Slope & Direction:		18° E								
Mineralogy:	Micae		Vegetation:		h. ke y. wh. do oak, Rod oak, CHASTNUT oak, blueberry, wh. pine		USDA		Scribe: 1/10								
Horizon	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	moist/SS	Structure Type, Grade, and Size	Moist Consistence	Hydrophobicity Temperature & Distribution	Redox Feature Color	Moist Feature Description	Roots	Moist Feature Description	Lab Sample ID	Notes
Op	0-12.5	5YR 2.5/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A	12.5-2.5	10YR 1/2	L	18	35	cu	< 3"	PO	2M GR	VFAW	AW	-	-	3F, 2M	0.1	-	
Bw	2.5-10	10YR 5/4	S.L	18	25	38% GR	2-2"	SS	1.5B, 1.5R	VER CW	CW	-	-	2F, 1C	0.25	-	Round edges of m. xed. of f. y. res. colluvium
Bw2	10-22	10YR 6/4	S.L	20	25	45% GR	1/8-3"	SS	1M, 5B, 1K	FR CW	CW	-	-	3M, 2F, 1C	0.5	-	
Bw	22-28	10YR 8/4	S.L	22	18	85% CN	3-5"	SS	1M, 5B, 1K	FR CW	CW	-	-	2M, 1F	0.1	-	loosely held together, ranging in part. in f. y. res. few stones 1/4" long
Bw	28-31	10YR 5/4	S.L	22	18	85% CN	1/8-5"	SS	1M, 5B, 1K	FR CW	CW	-	-	1C	4.8	-	
Bw	31-35	10YR 5/4	S.L	24	12	58% CN	< 6"	SS	1C, 5B, 1K	FC AW	AW	-	-	1M, 1F	1.5	-	Residuum
Bw	35+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Russell Pasco
 Field Assistant: Rachel Hill

Signature: Russell Pasco

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1083

Test Pit ID:	POS 140613-1105 RLL	Topographic Position:	Head slope - Sid slope	Parent material:	Siltstone Residua													
Date:	6/13/2016	% Slope:	26%	Slope Aspect:	60°													
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey	Drainage Class:	W/D	Depth to Water Table:	3'+													
RETTEW Job #:	089962000	Depth to Refusal:	3'±	Slope Failure or slip:														
MRCs Soil Unit:	GFe	Bedrock Type:	Siltstone	Dip Slope & Direction:	100° E													
Mineralogy:	Mixed	Vegetation:	Hard woods															
USDA																		
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (Inches)	Stability/ Substrata	Structure Type, Grade, and Size	Moist Consistence	Medium-Bearing Temperature & Consistence	Redox Feature Color	Redox Feature Description	Roots	Field Penetration/ pH	Lab Sample ID	Notes	
A	3	10YR2/1	S/L	10	25	5	CN	Po So	FGR	FR	CS	—	—	2F, M	5.4	—		
Bt ₁	15	10YR2/6	SIL	17	10	25	CN	SP	F2SBR	FR	GS	—	—	120 ZF	—	—		
								SS							4.4			
Bt ₂	24	10YR5/6	SIL	17	10	40	CN	SP	F2SBR	FR	GS	—	—	1F	—	—		
								SS							4.6			
C _r	34	10YR5/6	SIL	12	18	80	CN	Po	DM	FR	—	—	—	—	—	—		
								So							—			
R	34+																	

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Russell Losco
 Field Assistant: Rachel Hill

Signature: 

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063


Test Pit ID:	POS3A162613-1402-ALL					Topographic Position:	Head slope					Parent material:	Siltstone Residuum				
Date:	10/13/2016					% Slope:	31%					Slope Aspect:	NA				
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey					Drainage Class:	U2					Depth to Water Table:	42+				
RETTEW Job #:	089962000					Depth to Refusal:	42"					Slope Failure or slip:	NA				
NRCS Soil Unit:	BFE Mixed					Bedrock Type:	Siltstone					Dip Slope & Direction:	Hardwood S				
Mineralogy:						Vegetation:	USDA					Dip Slope & Direction:	42° Strike: 40°				
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (Inches)	Mineralogy	Structure Type, Grade, and Size	Moist Consistence	Bedrock Boundary Thickness & Orientation	Redox Feature Color	Bedrock Feature Description	Roots	Rock Fragmentation/ pH	Lab Sample ID	Notes
A	41	10YR3/2	SIL	15	15	S	ST	SP SS	F1GR	FR	cls	—	—	3VF	0.25	-	
Bw	19	10YR5/6	SIL	15	10	20	ST	SP SS	F2Slt	FR	GS	—	—	ZF ZM	0.5	-	
Cr	38	10YR5/8	SIL	18	10	80	CN	SP SS	F2SAR	FR	CW	—	—	IF	1.0	-	
R	42	—	—	—	—	—	—	—	—	—	—	—	—	—	—	-	

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Russell Losco
 Field Assistant: Rachel Hill

Signature: _____



RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	<u>PO 54 1606 13:10:55 RW</u>	Topographic Position:	<u>Head slope</u>	Parent material:	<u>Siltstone - Residuum</u>
Date:	<u>6/13/2016</u>	% Slope:	<u>29%</u>	Slope Aspect:	<u>D₀</u>
Job Name:	<u>Dominion - Atlantic Coast Pipeline Soil Survey</u>	Drainage Class:	<u>MUD</u>	Depth to Water Table:	<u>32'</u>
RETTEW Job #:	<u>089962000</u>	Depth to Refusal:	<u>39</u>	Slope Failure or slip:	<u>N/A</u>
NRCS Soil Unit:	<u>BfC</u>	Bedrock Type:	<u>Siltstone</u>	Dip Slope & Direction:	<u>5° 89° W 11° S Strike: N110E</u>
Mineralogy:	<u>Mixed</u>	Vegetation:	<u>Hardwoods</u>	USDA	

Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Fracture/bedrock	Structure Type, Grade, and Size	Moist Consistence	Medium Boundary Temperature & Resistance	Redox Feature Color	Redox Feature Description	Roots	Moisture/soil pH	Lab Sample ID	Notes
<u>OK</u>	<u>3</u>	<u>7.5YR2.5/1</u>	<u>SIL</u>	<u>15</u>	<u>10</u>	<u>-</u>	<u>-</u>	<u>PO</u>	<u>fly</u>	<u>FR</u>	<u>CS</u>	<u>-</u>	<u>-</u>	<u>3f, m</u>	<u>0</u>	<u>-</u>	
<u>Bw₁</u>	<u>13</u>	<u>10YR5/6</u>	<u>SIL</u>	<u>18</u>	<u>8</u>	<u>5</u>	<u>CV</u>	<u>SR</u>	<u>fine silt</u>	<u>FR</u>	<u>GS</u>	<u>-</u>	<u>-</u>	<u>3 m</u>	<u>1.0</u>	<u>-</u>	
<u>Bw₂</u>	<u>32</u>	<u>10YR5/1</u>	<u>SIL</u>	<u>18</u>	<u>12</u>	<u>25</u>	<u>CV</u>	<u>SR</u>	<u>fine silt</u>	<u>FR</u>	<u>CS</u>	<u>-</u>	<u>-</u>	<u>2 m/c</u>	<u>2.6</u>	<u>-</u>	
<u>C</u>	<u>39</u>	<u>10YR5/6</u>	<u>SIL</u>	<u>15</u>	<u>15</u>	<u>40</u>	<u>CN</u>	<u>SR</u>	<u>fine silt</u>	<u>FR</u>	<u>-</u>	<u>5YR5/6</u>	<u>7.5YR8/1</u>	<u>1 m</u>	<u>3.0</u>	<u>-</u>	
<u>R</u>	<u>39+</u>							<u>SD</u>	<u>DM</u>	<u>FR</u>					<u>4.2</u>		

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Russell Losco
 Field Assistant: Rachel Hill

Signature:



Test Pit ID:	P055160613-1110-RLZ					Topographic Position:	Backslope Summit					Parent material:	Siltstone Residuum				
Date:	8.13.16					% Slope:	10%					Slope Aspect:	3450				
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey					Drainage Class:	W/D					Depth to Water Table:	NA				
RETTEW Job #:	089962000					Depth to Refusal:	24"					Slope Failure or slip:	N/A				
NRCS Soil Unit:	Bfc Mixed					Bedrock Type:	Siltstone					Dip Slope & Direction:	320 S/E Strike: N100W				
Mineralogy:	USDA																
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (Inches)	Rooting/Stubble	Structure Type, Grade, and Size	Molt Consistence	Median Boundary Topography & Direction	Redox Feature Color	Rooting Description	Roots	Proctor Firmness/ pH	Lab Sample ID	Notes
R0	3	5YR 2.5/1	Silt	20	20	—	—	RO SS	E258L	KR	CS	—	—	2UF	0 4.4	—	—
Bu1	9	2.5Y 6/6	SIL	25	10	10	CN	SR SS	M258L	FR	GS	—	—	2 ^u m 2 ^f	2.5 4.2	—	—
Bu2	16	10YR 6/6	SIL	25	8	40	CN	SP SS	V258L	FR	CS	—	—	2 ^f	1.5 4.5	—	—
R	24	—	—	—	—	—	CN	SP SS SO	—	—	—	—	—	—	—	—	—

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Russell Losco
Field Assistant: Rachel Hill

Signature:



RETTEW Associates, Inc.
3020 Columbia Avenue
Lancaster, PA 17603
Phone: 717-394-3721
Fax: 717-394-1063

Test Pit ID:	Post 160613:117: RLL	Topographic Position:	Ridge top Saddle	Parent material:	Siltstone Residual												
Date:	4/13/16	% Slope:	11%	Slope Aspect:	130°												
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey	Drainage Class:	U3	Depth to Water Table:	30"												
RETTEW Job #:	089962000	Depth to Refusal:	30"	Slope Failure or slip:	NA												
NRCS Soil Unit:	Sp Al	Bedrock Type:	Siltstone	Dip Slope & Direction:	57°SE 18° Strike: N15°E												
Mineralogy:	USDA Forest																
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Bedrock Notation	Structure Type, Grade, and Size	Molt Consistence	Horizon Boundary Topography & Distances	Redox Feature Color	Redox Feature Description	Roots	Root Penetration/ in	Lab Sample ID	Notes
Oa	1	5YR3/2	SIL	10				PO	M2dR	ER	c/s	—	—	3.5F	0.5	4.6	
A	4	10YR4/3	SIL	25	10			SS	M2GR	FR	CS	—	—	3.5F	0.5	4.9	
B _h 1	10	10YR5/6	SIL	25	8	10%		SP	F2sBR	FR	GS	—	—	3.5F	0.75		
B _h 2	16	7.5YR5/6	SIL	25	20	40	1/2" x 2"	SP	VF2sBR	FR	GS	—	—	1.5F	1.5		
C1	21	Next 7.5YR/6 10YR5/6	SIL	20	20	50	CN	SP	DM	FR	CS	—	—	1.5F	1.5		Li. Hachromic Matrix color
R	30	5YR3/2	—	—	—		CN	—	—	—	—	—	—	—	—	—	
Refusal																	

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: **JAMES FISHER**
 Field Assistant: **MAX DUBAN + DAN FENSTERMAKER**

Signature: _____

[Handwritten Signature]

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID: **P-057-1003-1041-JDF**
 Date: **06-13**
 Job Name: **Dominion - Atlantic Coast Pipeline Soil Survey**
 RETTEW Job #: **089963000**
 NCRS Soil Unit: **BFE**
 Mineralogy: **Mixed**

Topographic Position: **SH**
 % Slope: **33%**
 Drainage Class: **well-drained**
 Depth to Refusal: **32"**
 Bedrock Type: **five grained sandstone**
 Vegetation: **< host oak, red oak, striped maple, bay maple, white birch**

Parent material: **colluvium - var residuum**
 Slope Aspect: **-**
 Depth to Water Table: **-**
 Slope Failure or Slip: **-**
 Dip Slope & Direction: **90° E**
 Slope Failure or Slip: **MAPLE BAY MAPLE, WHITE BIRCH**

USDA

Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Structure Type, Grade, and Size	Molt Consistence	Moisture Regime & Order	Redox Feature Color	Roots	Notes
DE	2	2.5YR 2.5/1	-	-	-	SN 8	< 1"	-	-	AS	all	3MT 3FT	siltstone
Bw1	12	10YR 5/6	SIL	22	20	CN 35% GR	1'	SP	IF	CS	-	3MT 2M	shale
								SO	BRK	CS	-	3MT 2M	shale
2Bw	20	10YR 5/6	SIL	20	20	GR 45% SN 75%	2"	SP	IF	CS	-	3MT 2M	shale
								SS	BRK	CS	-	3MT 2M	shale
2C	20	10YR 5/6	SIL	21	20	GR 40% SN 75%	3"	IF	VR	-	-	3MT 2M	shale
								BRK	VR	-	-	3MT 2M	shale
BR	32+	-	-	-	-	-	-	-	-	-	-	-	Reddish fine-grained sandstone

Other Notes:

Parent material 1 is colluvium
 2+3 is residuum

TEST PIT DESCRIPTION

Soil Scientist: JAMES FISHER
 Field Assistant: MAX DUGAN & D. SEMEREMAK

Signature: [Signature]

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	Date:		Job Name:	RETTEW Job #:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	Parent material:	Notes							
<u>P-058-160613-1B57-IDF</u>	<u>06/17/16</u>		<u>Dominion - Atlantic Coast Pipeline Soil Survey</u>	<u>089962000</u>	<u>BFE</u>	<u>M Red</u>	<u>Noise/Stone</u>	<u>Residual</u>								
							<u>% Slope:</u>	<u>Slope Aspect:</u>								
							<u>Drainage Class:</u>	<u>Depth to Water Table:</u>								
							<u>Depth to Refusal:</u>	<u>Slope Failure or Slip:</u>								
							<u>Bedrock Type:</u>	<u>Dip Slope & Direction:</u>								
							<u>Vegetation:</u>	<u>USDA</u>								
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Structure Type, Grade, and Size	Molt Confidence	Natural Boundary Topography & Orientation	Redox Feature Color	Redox Feature Description	Roots	Moisture Content (%)	Lab Sample ID	Notes
<u>De</u>	<u>1</u>	<u>5YR 2.5/2</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>GR 10%</u>	<u>2 1/4"</u>	<u>-</u>	<u>VR</u>	<u>AS</u>	<u>-</u>	<u>-</u>	<u>3F 2M DC</u>	<u>5.5</u>	<u>51</u>	<u>MINDR COLLUVIAL INFLUENCE</u>
<u>A</u>	<u>2</u>	<u>10YR 4/3</u>	<u>Si</u>	<u>8</u>	<u>4</u>	<u>GR 10%</u>	<u>2 1/4"</u>	<u>ZM 5R</u>	<u>HR</u>	<u>AS</u>	<u>-</u>	<u>-</u>	<u>3F 1M</u>	<u>4.6</u>	<u>52</u>	
<u>Bt1</u>	<u>12</u>	<u>2.5YR 5/6</u>	<u>SIL</u>	<u>18</u>	<u>20</u>	<u>CN 25%</u>	<u>2"</u>	<u>ZM 5R</u>	<u>FR</u>	<u>CS</u>	<u>-</u>	<u>-</u>	<u>2F 2M DC</u>	<u>2.6</u>	<u>53</u>	
<u>Bt2</u>	<u>20</u>	<u>10YR 4/4</u>	<u>SIL</u>	<u>24</u>	<u>18</u>	<u>CN 25%</u>	<u>1-3/4"</u>	<u>ZM 5R</u>	<u>FR</u>	<u>AS</u>	<u>-</u>	<u>-</u>	<u>1F 1M DC</u>	<u>3.3</u>	<u>34</u>	<u>siltstone</u>
<u>C</u>	<u>26</u>	<u>10YR 4/4</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>CN 95%</u>	<u>4"</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>0</u>	<u>-</u>	<u>-</u>	<u>12% MANGANESE ON ROCK SURFACES WITH SILTSTONE</u>
<u>R</u>	<u>26+</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>

Other Notes:

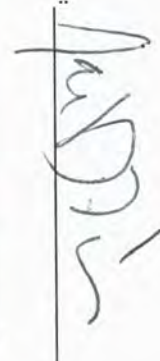
Horizon 5 labeled with of finer is between

TEST PIT DESCRIPTION

Soil Scientist:

James Fisher

Signature:



RETTEW Associates, Inc.
3020 Columbia Avenue
Lancaster, PA 17603
Phone: 717-394-3721
Fax: 717-394-1063

Test Pit ID: P-059-160613-1107-50F
 Date: 6/13/16
 Job Name: Dominion - Atlantic Coast Pipeline Soil Survey
 RETTEW Job #: 089962000
 NRCS Soil Unit: BTE
 Mineralogy: Mixed
 Topographic Position: % Slope: 49
 Drainage Class: Well-drained
 Depth to Refusal: 18"
 Bedrock Type: fine-grained sandstone
 Vegetation: RFB
 Parent material: SV/ridgetop
 Slope Aspect: 296
 Depth to Water Table: Residual
 Slope Failure or Slip: fine-grained sandstone
 Dip Slope & Direction: 15° E
 Strike: 342

Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture/ Swell/shrink	Structure Type, Grade, and Size	Moldboard Condition	Horizon Boundary Topography & Description	Redox Feature Color	Redox Feature Description	Roots	Field Measurement/ pH	Lab Sample ID	Notes
De 2	10YR 2/1	-	-	-	-	9F 5%	<1/2"	-	-	-	CS	-	-	3F 2M OC	5.6		fine-grained sandstone
A 6	10YR 3/3	S:L	18	20	9F 20%	1"	SP 3P 5S	2M 5BK	VFR AS	CS	-	-	2F 3M DC	1.2 4.5		fine-grained sandstone	
Bw1 1/2	10YR 6/4	S:L	72	22	9F 20%	1"	MP 5S	2M 5BK	FR CS	CS	-	-	0F 2M OC	2.0 4.6			
Bw2 1/8	7.5YR 6/4	S:L	24	22	9F 45%	3"	VR 4S	2M 5BK	F1 AS	AS	-	-	2M 1E	2.5 4.8		fine-grained sandstone	
R 18+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Russell Losco
 Field Assistant: Rachel Hall

Signature: 

REITW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1053

Test Pit ID: P060160613-1535-R2L
 Date: 6/13/16
 Job Name: Dominion - Atlantic Coast Pipeline Soil Survey
 RETTEW Job #: 089962000
 NRCS Soil Unit: Bf1e
 Mineralogy: fixed

Topographic Position: Back slope
 % Slope: 41%
 Drainage Class: U3
 Depth to Refusal: 12" on slab
 Bedrock Type: Sandstone
 Vegetation: Hard woods

Parent material: Residual
 Slope Aspect: ---
 Depth to Water Table: ---
 Slope Failure or slip: ---
 Dip Slope & Direction: S 40° E 30' / Strike: N 50° E

USDA

Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture/ Saturation	Structure Type, Grade, and Size	Molt Consistence	Median Boundary Temperature & Dispersion	Redox Feature Color	Redox Feature Description	Roots	Parent Temperature/ pH	Lab Sample ID	Notes
A	4	7.5yR2.5/	SIL	10	12			Ro	F2GR	FR	CS	---	---	3FVF	4.6	-	
Bw	12	10yR5/6	SIL	10	15	10	5T	Ro	F1SBL	FR	CS	---	---	3F	5.2	-	Possible boulder slab - dip is steeper than Rock outcrop nearby
R	12+	-	-	-	-	-	-	So	---	---	---	---	---	---	---	---	

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Russell Losco
 Field Assistant: Rachel Hill

Signature: Russell Losco

RETTEW Associates, Inc.
 3070 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1053


Test Pit ID:	POLD-1100619-1000-RLU					Topographic Position:	Shoulder - Nose		Parent material:	Colluvium over Residuum						
Date:	4/14/2016					% Slope:	34%		Slope Aspect:	220°						
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey					Drainage Class:	UD		Depth to Water Table:	38"						
RETTEW Job #:	089962000					Depth to Refusal:	38"		Slope Failure or slip:	-						
NRCS Soil Unit:	Pans E BFF					Bedrock Type:	Fine Sandstone		Dip Slope & Direction:	57°E / 150						
Mineralogy:	Mixed					Vegetation:	Maple-Hickory		USDA							
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (Inches)	Moisture/Structure	Molt Consistency	Soil Boundary Description	Redox Feature Color	Bedrock Feature Description	Roots	Soil Temperature/pH	Lab Sample ID	Notes
D _a	1.5	5YR2.5/1	-	-	-	-	-	PO SD	FR	CS	-	-	3F, 2M	0.25 4.5	-	-
A	4	7.5YR4/4	L	5	30	10	1/2	PO SD	FR	CS	-	-	3M, 1E	0.75 5.3	-	-
B _w	16	10YR5/6	L ^{GR}	15	40	20	1/2"	SP SS	FR	CS	-	-	2M	3.0 5.4	-	-
C _r	30	10YR6/4	L ^{NGR}	10	40	50	1/2-1"	SS SS	FR	CS	-	-	-	2.5 4.7	-	-
R	38	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Russell Loser
 Field Assistant: Rachel Hill

Signature: _____



Test Pit ID:	Date:	Job Name:	RETTEW Job #:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	% Slope:	Drainage Class:	Depth to Refusal:	Bedrock Type:	Vegetation:	Parent material:	Slope Aspect:	Depth to Water Table:	Slope Failure or slip:	Dip Slope & Direction:	Residuum	Lab Sample ID	Notes
	2062160614-1005-RL	Donition - Atlantic Coast Pipeline Soil Survey	089962000	Samma BIF	Mixed	Shoulder	35%	WD	39'	Ear Sandstone	Sugar Maple Locust								
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	bedrock / nodules	Structure Type, Grade, and Size	Moist Consistence	Median Boundary Topography & Orientation	Redox Feature Color	bedrock description	Roots	Water Penetration/ pH	Lab Sample ID	Notes		
Da	1	5YR2.5/1	—	—	—	10%	1/2 x 2"	—	C2GR	FR	CS	—	—	3F, F	0	—			
A	3	1.5YR 4/1	L	40	10	20% CN	1/2 x 3"	PO	M2GR	VFR	CS	—	—	3F, M	0	—			
Bu	13	1.5YR 5/1	L	35	8	40% CN	1 x 4"	PO	F2SbK	VFR	GS	—	—	2F	0.25	—			
Cr	32	1.5YR 5/1	SL	55	3	85% CN	1 x 10"	PO	Ø5bL	L	CW	—	—	—	1.0	—			
R	39	—	—	—	—	—	—	SO	—	—	—	—	—	—	5.3	—			

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Russell Losco
 Field Assistant: Rachel Hill

Signature: Russell Losco

RETTW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID: 2068-1601019-0950-RLI
 Date: 6/14/2016
 Job Name: Dominion - Atlantic Coast Pipeline Soil Survey
 RETTW Job #: 089962000
 NRCs Soil Unit: PamE
 Mineralogy: Mixed

Topographic Position: Saddle
 % Slope: 5%
 Drainage Class: SPD
 Depth to Refusal: 50±"
 Bedrock Type: NA
 Vegetation: Vetch, Goldensrod

Parent material: colluvium - Possible HTM
 Slope Aspect: 305°
 Depth to Water Table: 16"
 Slope Failure or slip: NA
 Dip Slope & Direction: NA
 Strike: NA

Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture/Soiliness	Structure Type, Grade, and Size	Mott Condition	Median Boundary Temperature & Disturbance	Redox Feature Color	Redox Feature Description	Roots	Moisture/Soiliness/ pH	Lab Sample ID	Notes
Ap	6	10YR5/1	SIL	15	10	—	—	SS	M2GR	FR	CS	—	—	IF	7.9		
Bt	16	10YR6/10	SIL	20	5	—	—	MS	M1SBT	F1	GS	—	—	✓	6.9		
								MS									
Bg	50	N8/1 7.5YR4/0	SIL	20	6	—	—	MS	M1SBT	F1		N8/1 7.5YR4/0 con	MSP	—	4.5		Small water seep at 29"
								MS									

Other Notes:

Old log staging area, open field with logging roads on both ends, loading pit in the northwest corner.

TEST PIT DESCRIPTION

Soil Scientist: Russell Losco
 Field Assistant: Russell Hill

Signature: 

RETTW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1053

Test Pit ID: P-064-140614-1020-RLL Topographic Position: Shoulder Parent material: colluvium over redstone
 Date: 2/11/2014 % Slope: 22% Slope Aspect: 40°
 Job Name: Dominion - Atlantic Coast Pipeline Soil Survey Drainage Class: Somewhat Poorly Drained Depth to Water Table: 191'
 RETTEW Job #: 089952000 Depth to Refusal: 30" Slope Failure or slip: NA
 NRCS Soil Unit: Paw F Bedrock Type: Fine Sandstone Dip Slope & Direction: 55°W 100
 Mineralogy: Mixed Vegetation: Sugar Maple - Sassafras USDA

Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Reactivity/Structure	Structure Type, Grade, and Size	Moist Consistence	Unconsolidated Topography & Orientation	Redox Feature Color	Redox Feature Description	Roots	Root Penetration/Depth	Lab Sample ID	Notes
O ₀	1	5YR2.5/1	—	—	—	—	—	SP	F1gR	FR	CS	—	—	ZF ₁ M	0	—	—
A	4	7.5YR2.5/1	SIL	18	5	10% ST	1/2"	SP	F2LGR	FR	CS	—	—	ZF ₁ M	0	—	—
B _{un1}	19	10YR6/10	SIL	18	5	25% ST	1/2"	SP	F2SBR	FR	CS	—	—	ZF ₁ M	1.75	—	—
B _{un2}	30	10YR6/14	SIL	15	5	20% ST	1/2"	SP	F1SBR	F1	AW	10YR7/2	CRD	ZVF	3.75	—	—
R	30+	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Russell Losco
 Field Assistant: Rachel Hill

Signature: Russell Losco

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID: P-0610-110414-1040-RLL Topographic Position: Backslope Parent material: HMT over colluvium
 Date: 6/11/16 % Slope: 70% Slope Aspect: -160°
 Job Name: Dominion - Atlantic Coast Pipeline Soil Survey Drainage Class: WD Depth to Water Table: 50+
 RETTEW Job #: 089962000 Depth to Refusal: 50+ Slope Failure or slip: NA
 NRCS Soil Unit: Pan E Bedrock Type: Fine Sandstone Dip Slope & Direction: NA
 Mineralogy: Mixed Vegetation: Sugar Maple

Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Particle Size	Structure Type, Grade, and Size	Moist Consistence	Median Boundary Topography & Disturbance	Redox Feature Color	Redox Feature Description	Roots	Root Penetration/Depth (in)	Lab Sample ID	Notes
A ⁿ	7	15YR5/1P	SL	3	70	30% CN1	1/2 x 3"	PO SS	FISBR	FR	CW	—	—	3F, 2M	0	6.1	
B ^w	18	15YR3/2	SL	5	60	70% CN	1/2 x 4"	PO SO	FISBR	VR	CW	—	—	2VF, 2M	0	6.4	
2A _b	28	5YR3/3	SL	5	60	30% CN	1/2 x 3"	PO SO	FISBR	VR	CW	—	—	2F, 1M	0.75	5.4	
2B _{wh}	40	15YR10/1	SL	5	70	30% CN	1/2 x 2"	PO SO	FISBR	FR	GS	—	—	1M	2.0	5.3	
2C _h	50	15YR4/3	SL	5	55	70% CN	1/2 x 3"	PO SO	DM	RR		—	—		3.5	5.1	

Other Notes:

Located downslope from a logging road, human transported material overlying colluvium is the result of the road cut.

TEST PIT DESCRIPTION

Soil Scientist: Steve Padlo
 Field Assistant: Stephanie Moraca

Signature: _____

Steve Padlo

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	0 067-160614-1441-5dd					Topographic Position:	backslope					Parent material:	col/rees				
Date:	06/14/16					% Slope:	20					Slope Aspect:	145				
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey					Drainage Class:	WD					Depth to Water Table:	N/A				
RETTEW Job #:	089952000					Depth to Refusal:	N/A					Slope Failure or slip:	N/A				
NRCS Soil Unit:	paddyknob-madsheep					Bedrock Type:	sandstone					Dip Slope & Direction:	-				
Mineralogy:	Mixed					Vegetation:	red maple, sugar maple, catalpa, iron wood					USDA					
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Planting/Soiliness	Structure Type, Grade, and Size	Molt Consistence	Major Boundary Topography & Orientation	Redox Feature Color	Roots	Product Temperature/ pH	Lab Sample ID	Notes	
0e	3	5YR2.5/1	-	-	-	Ch 20	1.5-2	-	-	-	aw	-	CF	<.25	-		
A	7	5YR3/2	sil	16	15	Ch 20	.5-2	PS	14gr	vfr	aw	-	CF	.25	-		
BA	10	5YR6/4	sil	18	12	Ch 25	.5-2	SS	1msbk	fr	cw	-	FM	2.25	-		
								PS						4.5			
Bt	30	5YR4/6	sicl	30	15	Ch 30	1.5-2	SS	2msbk	fr	cw	-	CF	3.25	-		
								PS						4.5			
2BC	50	7.5YR4/6	sil	20	14	Ch 65	.5-1	PS	1msbk	Fr	-	-	FT	4.0	-		
								SS						4.5			

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Steve Dadio
 Field Assistant: Stephanie Moraca

Signature: [Signature]

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	Date:	Job Name:	RETTEW Job #:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	% Slope:	Drainage Class:	Depth to Refusal:	Bedrock Type:	Vegetation:	Parent material:	Slope Aspect:	Depth to Water Table:	Slope Failure or Slip:	Dip Slope & Direction:	Roots:	Rock Fragmentation/Type & %	Rock Fragment Size (inches)	Multifaceted/Blockiness	Structure Type, Grade, and Size	Mollic Condition	Hydromorphy Topography & Disturbance	Redox Feature Color	Redox Feature Description	Lab Sample ID	Notes
	06/14/16	0665-160614-1338-sdd	089962000	paduknob - madsheep	mineralogy Mixed	summit	5	WD	30	sandstone	orchardgrass, locust, red maple, white oak	coll/res	34Z	N/A	N/A	15 N	M, H, FC	ch 25	1-4	-	1 fgr	vf	aw	-	-	SI	
																	M, H, FC	ch 25	1-4	-	1 fgr	vf	aw	-	-	S2	
																	M, H, FC	ch 25	1-4	-	1 fgr	vf	aw	-	-	S3	
																	M, H, FC	ch 25	1-4	-	1 fgr	vf	aw	-	-	S4	5YR 5/4 lithochromic colors
																	M, H, FC	ch 25	1-4	-	1 fgr	vf	aw	-	-		
																	M, H, FC	ch 25	1-4	-	1 fgr	vf	aw	-	-		
																	M, H, FC	ch 25	1-4	-	1 fgr	vf	aw	-	-		

Other Notes:

first red soil I've seen
 1st 3 horizons are frost-churned - not a pm choice
 * some faint 5YR 6/3 colors right above the R, could be lithochromic or artifact of compaction from the log landing.

TEST PIT DESCRIPTION

Soil Scientist: Steve Dadio
 Field Assistant: Stephanie Moraco

Signature: B Dadio

RETTEW Associates, Inc.
 3070 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	Date:	Job Name:	RETTEW Job #:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	% Slope:	Drainage Class:	Depth to Refusal:	Bedrock Type:	Vegetation:	Parent material:	Slope Aspect:	Depth to Water Table:	Slope Failure or slip:	Dip Slope & Direction:	Roots	Rock Fragmentation/Type & %	Rock Fragment Size (Inches)	Muscular/Stubborn	Structure Type, Grade, and Size	Molt Confidence	Bedrock Boundary Temperature & Orientation	Redox Feature Color	Bedrock Feature Description	Rock Fragmentation/Type & %	Lab Sample ID	Notes	
PO69-1606W-1158-sdd	06/14/16	Dominion - Atlantic Coast Pipeline Soil Survey	089962000			barkslope	17	WD	48																				
Oc	2	7.5YR 2.5/1																											
A	6	7.5YR 3/2																											
AB	9	7.5YR 4/3																											
B+	30	10YR 6/6																											
2Bc	48	10YR 5/6																											
2R	48+																												

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Steve Dadio
 Field Assistant: Stephanie Moraca

Signature: _____

Steve Dadio

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	Date:	Job Name:	RETTEW Job #:	NCS Soil Unit:	Mineralogy:	Topographic Position:	Parent material:	Notes								
P070-160614-1102-sbd	06/14/16	Dominion - Atlantic Coast Pipeline Soil Survey	089962000	Paddyknob - mad sheep	M: xq	Summit	res									
						% Slope: 2%	Slope Aspect: 79									
						Drainage Class: WD	Depth to Water Table: N/A									
						Depth to Refusal: 31	Slope Failure or slip: N/A									
						Bedrock Type: sandstone	Dip Slope & Direction: 5 NW									
						Vegetation: sugar maple, hickory	Strike: 50									
						USDA										
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture/Structure	Moist Consistence	Moist Consistence	Redox Feature Color	Redox Feature Description	Roots	Rock Fragmentation/ID	Lab Sample ID	Notes
De	3	5YR2.5/1	-	-	-	Ch 40	1-4	-	-	aw	-	-	M F	<.25	-	
A	8	7.5YR3.1	1	15	35	Ch 40	1-4	PS	vfr	aw	-	-	CF CM CC	.75	-	high OM content
Bw	18	10YR5/6	1	15	40	Ch 55	2-4	PS	fr	aw	-	-	FF FM FC	1.25	-	
C	31	10YR5/6	1	13	42	Cl 70	2-8	PS	fr	aw	-	-	FW	1.5	-	
R	31+	-	-	-	-	-	-	SO	-	-	-	-	-	5.25	-	

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Steve Dadio
 Field Assistant: Stephanie Moraca

Signature: _____

Steve Dadio

RETTW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	Date:	Job Name:	NCS Soil Unit:	Mineralogy:	Topographic Position:	Parent material:	Soil Aspect:	Depth to Water Table:	Slope Failure or Slip:	Dip Slope & Direction:	Roots	Rock Fragmentation Type & %	Rock Fragment Size (inches)	Structure Type, Grade, and Size	Moist. Consistence	Redox Feature Color	Redox Feature Description	Lab Sample ID	Notes	
P071-16064-1001-SDD	06/14/16	Dominion - Atlantic Coast Pipeline Soil Survey	paddyknob - madsheep	Mixed	Shoulder		148	N/A	N/A	30 East	M F	40	1-2	1 fgr	wfr	aw			coll / res	
					10-15					sugar maple, red maple, shagbark hickory	M F	40	1-2	1 fgr	wfr	aw				very high OM nearly an Oe
					WD						M F	40	1-2	1 fgr	wfr	aw				
					30						M F	40	1-2	1 fgr	wfr	aw				
					Sandstone						M F	40	1-2	1 fgr	wfr	aw				
					USDA						M F	40	1-2	1 fgr	wfr	aw				
Oe	4	5YR 2.5/1	-	-	-	aw	-	-	-	M F	40	1-2	1-2	1 fgr	wfr	aw				
A	9	7.5YR 2.5/2	5:1	12	15	ch	40	1-2	1-2	PS	50	1 fgr	1 fgr	fr	aw					
										PS	50	1 fgr	1 fgr	fr	aw					
Bv	18	7.5YR 4/6	5:1	13	13	ch	60	1-6	1-6	PS	50	1 fgr	1 fgr	fr	aw					
										PS	50	1 fgr	1 fgr	fr	aw					
2C	30	10YR 4/4	1	16	30	ch	90	1-6	1-6	PS	50	1 fgr	1 fgr	fr	aw					
										PS	50	1 fgr	1 fgr	fr	aw					
2R	30+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Steve Dadio

Field Assistant: Stephanie Moraco

Signature: _____

S. Dadio

RETTEW Associates, Inc.
3020 Columbia Avenue
Lancaster, PA 17603
Phone: 717-394-3721
Fax: 717-394-1063

Test Pit ID:	p072-160616-1447-5dd				Topographic Position:	mild back slope				Parent material:	colluvies						
Date:	06/16/16				% Slope:	WD				Slope Aspect:	225						
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey				Drainage Class:	WD				Depth to Water Table:	N/A						
RETTEW Job #:	089962000				Depth to Refusal:	32				Slope Failure or Slip:	-						
NRCS Soil Unit:	Paddyknob - mad				Bedrock Type:	sandstone				Dip Slope & Direction:	12 NE						
Mineralogy:	K.Xed				Vegetation:	sugar maple, black cherry, striped maple				Strike:	322						
Horizon	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	rockiness/fragments	Structure Type, Grade, and Size	Molt Confidence	Moisture Regime	Redox Feature Color	Moisture Regime Description	Roots	Moisture Regime Description	Lab Sample ID	Notes
Do	2	7.5R 2.5/1	-	-	-	9f 55	.5-2	-	-	-	-	-	-	MF CM	-	4.25	-
																5.75	
A	4	10YR 7/2	1	12	50	9f 55	.5-2	PO	1 fgr	Vfr	-	-	-	CF CM	-	.25	-
																5.25	
Bw1	18	10YR 5/6	51	12	60	40 Ch	1-4	PO	2 msbk fr	fr	-	-	-	CF CM	-	1.25	-
																5.25	
Bw2	30	10YR 5/6	51	12	60	60 Ch	1-6	PO	1 msbk fr	fr	-	-	-	FF	-	2.25	-
																5.25	
2R	32+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Steve Didio
 Field Assistant: Stephanie Moraco

Signature: _____

S. Didio

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1069

Test Pit ID: PO73-160616-1402-sdd Topographic Position: Backslope Parent material: Colluvium
 Date: 06/16/16 % Slope: 27 Slope Aspect: 318
 Job Name: Dominion - Atlantic Coast Pipeline Soil Survey Drainage Class: SED Depth to Water Table: N/A
 RETTEW Job #: 089962000 Depth to Refusal: N/A Slope Failure or slip: N/A
 NRCS Soil Unit: paddyknob - midsheep Bedrock Type: N/A Dip Slope & Direction: N/A
 Mineralogy: Mixed Vegetation: black cherry saplings, red maple saplings, locust saplings
 USDA

Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (Inches)	Rockiness/ Solution	Structure Type, Grade, and Size	Mold Compressibility	Moisture Boundary Characteristics	Redox Feature Color	Water Feature Description	Roots	Rock Fragmentation/ M	Lab Sample ID	Notes							
A	2	7.5YR ^{2.5} /1	-	-	-	65 ch	5-3	-	-	-	CW	-	-	CF CM FC	-	-	-							
																		PS	1fgf	vfr	ow	CF CM CC	5.0	-
																		SS						
Bw	14	7.5YR ⁵ /6	s	16	41	75 ch	2-6	PS	1fsbk	fr	ow	-	-	WF CM CC	-	-	-	-						
																			SS					
C	50	7.5YR ⁵ /6	s	15	42	95 ch	2-6	PS SS	Osg	lo	-	-	-	-	-	-	-	-						
																			SS					

Other Notes:

test pit did get to 50, but collapsed at 42 during investigation due to ↑ rock content
 pocket penetrometer readings, unable to be obtained due to ↑ rock content

TEST PIT DESCRIPTION

Soil Scientist: Steve Dodio
 Field Assistant: Stephanie Moraco

Signature: B. Dodio

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	Date:	Job Name:	RETTEW Job #:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	% Slope:	Drainage Class:	Depth to Refusal:	Bedrock Type:	Vegetation:	Parent material:	Slope Aspect:	Depth to Water Table:	Slope Failure or slip:	Dip Slope & Direction:	Roots	Proctor Test(s) or ρ_d	Lab Sample ID	Notes		
P074-160616-1238-5dd	06/16/16	Dominion - Atlantic Coast Pipeline Soil Survey	089962000		Mixed	Summit	0.5%	WD	26	fine-grained sandstone	sugar maple, hickory, shagbark hickory										residuum	
Oe	2	7.5YR 2.5/1	-	-	-	40 ch	2-4	-	-	ow	-	ow	-	-	-	-	ow	CF CH	0.5 5.25	-		
A	4	7.5YR 3/2	-	-	-	40 ch	2-4	-	-	ow	-	ow	-	-	-	-	ow	CF CN CC	0.5 5.1	-		
Bw	24	7.5YR 5/6	-	-	-	60 f1	2-12	-	-	ow	-	ow	-	-	-	-	ow	CM CC	0.75 4.75	-		
R	24 ⁺	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Steve Dadio
 Field Assistant: Stephanie Moraca

Signature: [Signature]

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	Date:	Job Name:	RETTEW Job #:	Mineralogy:	Topographic Position:	Parent material:	Notes									
P075-160616-1140-sdd	06/16/16	Dominion - Atlantic Coast Pipeline Soil Survey	089962000	Madsheep - Paddy Knob	Shoulder/lupper bs	coll fines										
					% Slope: 16	Slope Aspect: 18										
					Drainage Class: WD	Depth to Water Table: N/A										
					Depth to Refusal: 26	Slope Failure or slip: N/A										
					Bedrock Type: Sugar maple, red maple, northern red oak	Dip Slope & Direction: 26° E/NE										
					Vegetation: USA	Strike: 310										
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Rockiness (soilless)	Structure Type, Grade, and Size	Molt Confidence	Moisture Boundary Topography & Disturbance	Redox Feature Color	Moist Feature Description	Roots	Moisture Parameter/pt	Lab Sample ID
Oe	3	5YR 2.5/1	-	-	-	40 gr	.5-2	-	-	-	ow	-	-	HF NH	<.25	-
A	5	7.5YR 3/2	1	9	42	40 gr	.5-2	PO	1f gr	vfr	ow	-	CF CM CC	.25	-	
Bw	14	10YR 5/6	1	10	45	45 Ch	2-4	PS	1m sil	fr	cw	-	CF CM CC	.75	-	
ZC	24	10YR 5/6	1	10	50	70 F=1	2-4	PS SS	O m	fr	ow	-	CM FC	.75	-	
ZR	26+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Steve Radio
 Field Assistant: Stephanie Moraca

Signature: _____

[Handwritten Signature]

RETTW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P076 - 160616 - 1055 - Sdd					Topographic Position:	backslope					Parent material:	callnes				
Date:	06/16/16					% Slope:	19					Slope Aspect:	306				
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey					Drainage Class:	W0					Depth to Water Table:	N/A				
RETTW Job #:	089962000					Depth to Refusal:	45					Slope Failure or slip:	N/A				
NCS Soil Unit:	Mad Sheep - Paddy Knob					Bedrock Type:	sandstone					Dip Slope & Direction:	30 SSE				
Mineralogy:	Mixed					Vegetation:	sugar maple, striped maple, northern red oak					Strike:	235				
Horizon	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture/ Swell	Structure Type, Grade, and Size	Moist Consistence	Moisture Secondary Temperature & Direction	Redox Feature Color	Redox Feature Description	Roots	Root Penetration/ ft	Lab Sample ID	Notes
Oa	2	7.5YR 2.5/1	-	-	-	9f 30	.5-2	-	-	-	aw	-	-	CF	<.25	-	
A	4	10YR 2/1	5:1	10	40	9f 30	.5-2	P0	1fgf	fr	aw	-	-	CF	.25	-	
BA	10	10YR 4/6	1	10	50	9f 35	.5-2	P0	1fsbk	fr	aw	-	-	CF	.75	-	
Bsw	20	10YR 6/6	1	10	55	ch 40	.5-2	P5	1msbk	fr	aw	-	-	CF	1.25	-	
								so							5.25		
2C	38	10YR 6/6	1	8	58	f1 85	1-6	P5	0m	fr	cw	-	-	FM	1.0	-	
								so							5.25		
2Cr	45	-	-	-	-	-	-	-	-	-	aw	-	-	-	-	-	-
								-									
2R	45+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
								-									

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Steve Dadio
 Field Assistant: Stephanie Moraco

Signature: _____

[Handwritten Signature]

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	<u>P077-160617-1035-5dd</u>	Topographic Position:	<u>footslope</u>	Parent material:	<u>colluvium</u>
Date:	<u>06/17/16</u>	% Slope:	<u>13</u>	Slope Aspect:	<u>236</u>
Job Name:	<u>Dominion - Atlantic Coast Pipeline Soil Survey</u>	Drainage Class:	<u>MW</u>	Depth to Water Table:	<u>28</u>
RETTEW Job #:	<u>089962000</u>	Depth to Refusal:	<u>N/A</u>	Slope Failure or slip:	<u>N/A</u>
NRCS Soil Unit:	<u>paddy knob mad sheep</u>	Bedrock Type:	<u>sandstone?</u>	Dip Slope & Direction:	<u>N/A</u>
Mineralogy:	<u>M, mixed mad sheep</u>	Vegetation:	<u>sugar maple, hickory, northern red oak</u>	Strike:	<u>—</u>

Horizon	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Roots/Stubble	Structure Type, Grade, and Size	Moist Consistence	Water Boundary Topography & Orientation	Redox Feature Color	Molar Feature Description	Roots	pH	Lab Sample ID	Notes
De	2	7.5YR 2/1	—	—	—	60 ch	1-14	—	—	—	aw	—	—	MF	4.25	S1	
A	8	7.5YR 2.5/2	s.l	18	20	60 ch	1-14	PS	2mgr	vf	aw	—	—	MF	2.25	S2	
								SS						MF	5.5		
B+1	21	10YR 6/6	s.l	25	16	30 ch	2-4	PS	2msdk	fm	cw	—	—	CF	1.5	S3	
								SM						CF	4.75		
B+2	28	10YR 5/6	s.l	35	14	20 ch	2-4	PH	2msdk	fr	cw	—	—	CF	2.0	S4	
								SM						CF	5.0		
B+3	50	10YR 5/6	s.l	43	12	15 ch	2-4	PH	2msdk	fi	—	—	—	FH	74.5	S5	
								SM						FH	5.25		

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Steve Dadio
 Field Assistant: Stephanie Moraca

Signature: [Signature]

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	<u>POTR-160617-1201-5dd</u>	Topographic Position:	<u>backslope</u>	Parent material:	<u>colluvial</u>
Date:	<u>06/17/16</u>	% Slope:	<u>27</u>	Slope Aspect:	<u>278</u>
Job Name:	<u>Dominion - Atlantic Coast Pipeline Soil Survey</u>	Drainage Class:	<u>WD</u>	Depth to Water Table:	<u>N/A</u>
RETTEW Job #:	<u>089962000</u>	Depth to Refusal:	<u>N/A</u>	Slope Failure or slip:	<u>N/A</u>
NRCS Soil Unit:	<u>paddyknoh - midsheep</u>	Bedrock Type:	<u>argilline-grained sandstone</u>	Dip Slope & Direction:	<u>[> 90° sugar maple]</u>
Mineralogy:	<u>m, x, rd</u>	Vegetation:	<u>sugar maple, red maple</u>	Strike:	<u>-</u>

Horizon	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture/Structure	Moisture/Consistence	Moisture/Consistence	Moisture/Consistence	Redox Feature Color	Moisture/Consistence	Roots	Rock Fragmentation	Lab Sample ID	Notes
Oe	2	7.5YR 2.5/1	-	-	-	ch 50	1-4	-	-	aw	aw	-	-	M = CM	<.75	-	
A	6	7.5YR 2.5/2	s, l	15	20	ch 50	1-4	PS	1 fgr	vfr	aw	-	-	M = CM	.25	-	
AB	12	2.5YR 4/4	s, l	16	15	ch 40	1.5-2	PS	1 f sbk	vfr	aw	-	-	CM	5.5	-	
2B+	26	5YR 4/6	s, l	22	18	ch 30	1.5-2	PS	2 msbk	fr	cu	-	-	CM	1.25	-	
3BC	44	2.5YR 4/4	Sci	30	15	ch 10	.5-2	PS	1 msbk	fr	cu	-	-	FH FC	3.75	-	
3G	50+	-	-	-	-	-	-	PS	-	-	-	-	-	-	5.0	-	

Other Notes: 2 colluvial events

TEST PIT DESCRIPTION

Soil Scientist: Steve Dadio
 Field Assistant: Stephanie Moraca

Signature: [Signature]

RETTW Associates, Inc.
 3030 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID: PO79-160617-1251-5db
 Date: 06/17/16
 Job Name: Dominion - Atlantic Coast Pipeline Soil Survey
 RETTW Job #: 089962000
 NCS Soil Unit: Paddyknob - madsheep
 Mineralogy: Mixed

Topographic Position: 5% bench
 % Slope: 11/5
 Drainage Class: W/D
 Depth to Refusal: 32
 Bedrock Type: Sandstone
 Vegetation: sugar maple, red maple

Parent material: res
 Slope Aspect: N/A
 Depth to Water Table: N/A
 Slope Failure or slip: N/A
 Dip Slope & Direction: 10 N
 Strike: 65

Horizon	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	USDA		Structure Type, Grade, and Size	Moist Consistence	Moisture Boundary Topography & Disturbance	Redox Feature Color	Redox Feature Description	Roots	Rock Fragmentation/ pH	Lab Sample ID	Notes	
								rock/frag	SS										
De	2	5YR 2.5/1	-	-	-	ch 20	.5-1	-	-	-	-	aw	-	-	CF	<.25	-		
A	4	7.5YR 3/2	s.l	14	15	ch	.5-1	PS	SS	1 fgr	vfr	cw	-	-	CF	.25	-		
								SS	SS	1 fsk	fr	cw	-	-	CM	5.5	-		
Bt	24	7.5YR 4/6	s.c	30	18	ch 30	.5-2	PM	SS	2msk	fr	aw	-	-	CM	3.75	-		
								SS	SS						CC	5.1	-		
Cr	32	-	-	-	-	-	-	-	-	-	-	aw	-	-	-	-	-	-	
R	32+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: P. Fenstermaker
 Field Assistant: Karla Hill

Signature: [Signature]

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	R-080-100017-1000-DEF	Topographic Position:	lower back slope	Parent material:	Yellowish over red silty loam
Date:	6/17/10	% Slope:	8-1%	Slope Aspect:	346°
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey	Drainage Class:	Well	Depth to Water Table:	-
RETTEW Job #:	089962000	Depth to Refusal:	40"	Slope Failure or slip:	-
NRCS Soil Unit:	Paddy Knob - Mad Sheep Campy (P&E)	Bedrock Type:	Sandstone	Dip Slope & Direction:	-
Mineralogy:	Mixed	Vegetation:	Red oak, Sugar maple, Whiteside oak	Strike:	-

Horizon	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Structure Type, Grade, and Size	Moist Consistence	Median Boundary Horizontality & Orientation	Redox Feature Color	Redox Feature Description	Roots	Moist Bulk Density (g/cc)	Lab Sample ID	Notes
O _i	0-5	7.5YR 3/1	-	-	-	-	-	-	-	-	-	-	3F	-	S1	Few 5yr roots
O _a	5-22	5YR 2.5/1	-	-	-	-	-	-	-	-	-	-	af, m	4.5	S6	minor colloidal in clumps sent to sand analysis
A	2-6.5	7.5YR 2.5/1	SL	60	10	45% GR	2-3"	af 50k	Frcw	-	-	-	af	0.5	S2	
BA	6.5-14	7.5YR 4/3	SL	68	10	35% GR	2-2"	af 50k	IFr	CW	-	-	af	0.75	S3	
								50	IFr	CW	-	af	5.0			
2B _{ws}	14-34	7.5YR 5/3	SL	65	12	30% GR	1-4"	af 50k	VFr	CW	-	-	af	1.25	S4	
								50	VFr	CW	-	af	5.4			
2C	34-40	7.5YR 9/4	SL	67	8	45% CoB	2-8"	af 50k	Fr	AW	-	-	af	0.75	S5	
								50	Fr	AW	-	af	5.15			
2R	40+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Other Notes: No clear bedding plane - rock surface is way w 4" - No Dpt strike.

TEST PIT DESCRIPTION

Soil Scientist: D. Fenstermaker
 Field Assistant: Rachel Hill

Signature: [Handwritten Signature]

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P-081-1001017-1010-DEF	Topographic Position:	Upper Backslope from Summit	Parent material:	Callium over Residuum											
Date:	4/17/10	% Slope:	10%	Slope Aspect:	240°											
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey	Drainage Class:	Well	Depth to Water Table:	-											
RETTEW Job #:	089962000	Depth to Refusal:	36	Slope Failure or slip:	-											
NRCS Soil Unit:	Paddywood-Mudspur complex (Bawd)	Bedrock Type:	Sandstone - Conglomerate	Dig Slope & Direction:	-											
Mineralogy:	Mixed	Vegetation:	Sugar maple (85%), Shrub: st. red maple, white Ash, (H) Kerns + grass	Strike:	-											
USDA																
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Structure Type, Grade, and Size	Moist Consistence	Natural Boundary Topography & Orientation	Redox Feature Color	Redox Feature Description	Roots	Rock Fragmentation/pt	Lab Sample ID	Notes
O:	0-1.5	7.5YR 3/1	-	-	-	-	-	-	-	-	-	-	3f	-	-	-
A	1.5-5	7.5YR 2.5/1	SL	12	57	40% CB	1/2-8"	1500K	Vfr	Cw	-	-	3f 2m	0.25	-	-
PB	5-8.5	7.5YR 4/3	SL	12	68	40% CB	1/2-7"	1450K	Vfr	Cw	-	-	3f 2m 1c	4.7	-	-
PBw	8.5-20	10YR 5/4	SL	14	66	20% GR	L 3"	1450K	Vfr	Cw	-	-	2f 1m	0.75	-	-
2BL	20-36	7.5YR 5/4	SL	14	58	60% STONES	4-20"	1650K	Fr	Aw	-	-	1f	1.5	-	-
2R	36+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Other Notes: Undulating bedrock in bottom of pit. No clear bed for dip strike. Rock is fight with few fines in fractures in between and too hard to break up for dig through.

TEST PIT DESCRIPTION

Soil Scientist: JOHN WAY
 Field Assistant: MIGUEL PARAVES

Signature: [Signature]

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	Date:	Job Name:	RETTEW Job #:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	% Slope:	Drainage Class:	Depth to Refusal:	Bedrock Type:	Vegetation:	Parent material:	Slope Aspect:	Depth to Water Table:	Slope Failure or slip:	Dip Slope & Direction:	Roots	Rock Fragmentation/PI	Lab Sample ID	Notes
P-082-160617-1070-SSW	6/12/16	Dominion - Atlantic Coast Pipeline Soil Survey	089962000	PADDYKNOB-MADSHED	SILICEOUS	SUMMIT	1%	WELL	31"	SANDSTONE	MAPLE, FERN, BLACKBERRY	RESIDUAL						0.25		
0e	0'-1	S-1225/1															3-4F	4.5		
D	1'-2	10R211	F5V	8	60	10	CH	0.5-2									2-F 1-M	0.25		
BA	2'-5	2.51R211M	F5V	12	65	10	CU	1-2									2-F 1-C	0.25		
BW1	5'-12	10R510	SL	13	65	12	CH	1-2									1-M, F	0.5		
BW2	12'-24	10R510	SL	13	72	55	CH	2-5									1-M, F	0.5		
CU	24-31	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R	31x	SANDSTONE				BEDROCK														

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: DEBRA WILK
 Field Assistant: MIGUEL TABARES

Signature: 

RETTW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1053

Test Pit ID:	P-083-160612-1011-25W	Topographic Position:	Backslope	Parent material:	colluvium over residuum
Date:	6/17/16	% Slope:	34%	Slope Aspect:	147°
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey	Drainage Class:	well	Depth to Water Table:	-
RETTW Job #:	089962000	Depth to Refusal:	36"	Slope Failure or slip:	-
NRCS Soil Unit:	PADDYK00B - MAD SHEEP	Bedrock Type:	SANDSTONE	Dip Slope & Direction:	180SE (137°) Strike: 47°
Mineralogy:	SLICE003	Vegetation:	MARLE, WICKEROY, STRIPING MARLE		

Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (Inches)	Moisture/Structure	Structure Type, Grade, and Size	Moist Consistency	Moist Consistency	Redox Feature Color	Water Feature Description	Roots	Rock Resistance/ pH	Lab Sample ID	Notes	
De	0-5	5YR2/5/1	-	-	-	-	-	-	-	-	-	-	-	3-VF, 2-F, M	4.5	SL K/B		
A	0-5	10YR2/1	SL	11	65	10 CH	1-3	PO SO	10YR2/1	VF	am	-	-	3-VF, 2-M, C	0.25 4.5	S2 A/B		
Bp	5-9	10YR2/1X	SL	7	80	12 CH	1-3	PO SO	10YR2/1	VF	am	-	-	2-VF, 3-F, M, 1-C	20.25 5.0	S3 A/R		
Bx	9-21	10YR2/1b	CH SL	16	70	20 CH	2-5	PO SO	10YR2/1	VF	cm	-	-	3-VF, 2-F, M, 1-VF	1.0 5.5	S4 A/B	CLAY NODULES	
2C1	21-30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
2R	30x	SAND	STONE															

Other Notes: LINEAR CONCREX BACKSLOPE (NOSE)

TEST PIT DESCRIPTION

Soil Scientist: Dr. JOHN WAH

Field Assistant: MIGUEL PAARMES

Signature:



RETTEW Associates, Inc.
3020 Columbia Avenue
Lancaster, PA 17603
Phone: 717-394-3721
Fax: 717-394-1063

Test Pit ID:	P-084-160617-1005-15W	Topographic Position:	BACKSLOPE	Parent material:	COCCURVA OVER RESIDUUM											
Date:	06-17-2016	% Slope:	8%	Slope Aspect:	177°											
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey	Drainage Class:	WELL	Depth to Water Table:	-											
RETTEW Job #:	089962000	Depth to Refusal:	31"	Slope Failure or Slip:	-											
NRCS Soil Unit:	TADPY KNOB-HAD SHEET	Bedrock Type:	SILTSTONE	Dip Slope & Direction:	-											
Mineralogy:	MIXED	Vegetation:	HAPLE		Striker: -											
USDA																
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (Inches)	Structure Type, Grade, and Size	Molt Consistence	Moist Reaction	Redox Feature Color	Moist Feature Description	Roots	Field Penetration/psi	Lab Sample ID	Notes
De	0-2	5YR2.5/1	-	-	-	-	-	-	-	-	-	-	3VEF 2H	4.5	-	-
A	2-5	7.5YR3/2	SIL	10	15	5% GR	<1	PO 50	FR	AW	-	-	3VEF 1M 2C	0.25	-	-
BE1	5-11	7.5YR4/6	SIL	16	20	12% CH	0.5-2	SP 55	FR	CW	-	-	3VF 1M	0.5	-	SHAD STONE COF
BE2	11-21	7.5YR5/6	SIL	21	18	10% CH	0.5-2	MP 55	FR	CW	-	-	2F 1C	1.0 4.5	-	CLAY SKINS SHAD STONE COF
2Cr	21-31	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2R	31+	SILT STONE	BEDROCK	-	-	-	-	-	-	-	-	-	-	-	-	-

Other Notes: ROAD BACKSLOPE ON RIDGE NOSE; STEEPLY SLOPING OFF SIDES

TEST PIT DESCRIPTION

Soil Scientist: John C Roberts
 Field Assistant: Taylor Walter

Signature: _____

John C Roberts

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	Date:	Job Name:	RETTEW Job #:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	% Slope:	Drainage Class:	Depth to Refusal:	Bedrock Type:	Vegetation:	Parent material:	Slope Aspect:	Depth to Water Table:	Slope Failure or slip:	Dip Slope & Direction:	Notes
P-085-160610-1031-25K	6-16-2010	Dormition - Atlantic Coast Pipeline Soil Survey	089962000	Paddyknob - Mad Sheep	Mixed	Shoulder Slope	10%	WD	3Z	Sand stone	Which Hazel, Red Maple, White Oak						Call / Residuum
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (Inches)	Number/Section	Structure Type, Grade, and Size	Moist Consistence	Nation Boundary Topography & Distances	Redox Feature Color	Moisture Description	Roots	Moisture Potential/psi	Lab Sample ID	Notes
0e	1.5	5YR 2.5/2	—	—	—	GR 5	0.5-1.0	—	GR 1F	—	—	—	—	2uf	—	—	—
A	4	10YR 8/2	VG R SIL	12	15	GR 35	0.5-1.5	PO SS	GR 1m	VFR	AW	—	—	2uf, f 1m	0.25	—	—
BA	9	10YR 9/4	VG R SIL	14	18	GR 40	0.5-2.0	PO SS	SBK 1m	VFR	CW	—	—	3m 2uf, f, co	0.5	—	—
Bw1	24	10YR 4/6	VG R SIL	16	18	GR 50	1-3.0	SP SS	SBK 1m	FR	GW	—	—	2f 1m	0.5	—	—
ZB1	37	10YR 5/6	VCH	22	12	VCH 65	2-6.0	SP SS	SBC 2m	FR	AW	—	—	1f	1.5	—	—
ZR	37+	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	Sand stone

Other Notes:

Call / Residuum @ 24
 Pig + stiver could not be recorded

TEST PIT DESCRIPTION

Soil Scientist: John C Roberts
 Field Assistant: Taylor Walters

Signature: _____

John C Roberts

346
20

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P-0816-160610-1149-5CR		Topographic Position:		Shadyside / Saddle		Parent material:		Coll / Residuum					
Date:	6-16-2016		% Slope:		25%		Slope Aspect:		176°					
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey		Drainage Class:		WD		Depth to Water Table:		—					
RETTEW Job #:	089962000		Depth to Refusal:		42		Slope Failure or slip:		—					
NRCS Soil Unit:	Paddyknob - Mad sheep		Bedrock Type:		Sandstone		Dip Slope & Direction:		150 N					
Mineralogy:	MIXED		Vegetation:		Strip Maple, Red Maple, White Oak		Strike:		2560					
USDA														
Horizon	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Structure Type, Grade, and Size	Moist Consistence	Moist Boundary Temperature & Distribution	Redox Feature Color	Roots	Notes	
A	5	7.5YR 3/2	SIL	15	18	GR 10	0.25-1.0	GR 1F	MR	CW	—	2f, m	0.25 4.6	—
BA	9	7.5YR 4/4	SIL	15	20	GR 20	0.25-2.0	SBR 1F	VFR	CW	—	1f, 2m	0.5 5.0	—
Bw1	17	7.5YR 5/6	SIL	17	28	GR 30	0.5-2.0	SBR 1M	FR	CW	—	2m, 1f	1.0 5.0	—
Bw2	26	7.5YR 5/6	SIL	18	30	GR 20	0.5-1.0	SBR 1M	FR	CW	—	1f, 1m	0.75 4.5	Five grain sandstone
ZC	42	7.5YR 5/6	—	—	—	CH 88	1-4	Rock cont'd	—	CW	—	1f	—	Very fine sandstone
ZR	42+	—	—	—	—	—	—	—	—	—	—	—	—	—

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: John C Roberts
 Field Assistant: Taylor Walker

Signature: _____

John C Roberts

RETTW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	D-087-160616-1416-3R		Topographic Position:	Concave hood slope		Parent material:	Colluvium										
Date:	8-16-2016		% Slope:	13%		Slope Aspect:	-										
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey		Drainage Class:	WD		Depth to Water Table:	-										
RETTW Job #:	089962000		Depth to Refusal:	-		Slope Failure or slip:	-										
NRCS Soil Unit:	Paddykub - Mod shap		Bedrock Type:	Sandstone		Dip Slope & Direction:	-										
Mineralogy:	Mixed		Vegetation:	Hop hornbeam, Red Maple, Stripe Maple		USDA	-										
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (Inches)	rubby/ subangular	Structure Type, Grade, and Size	Moist Consistence	Medium Bulk Density, Topography & Disturbance	Redox Feature Color	Water Feature Description	Roots	Rock Fragmentary (%)	Lab Sample ID	Notes
0e	1	5YR 2.5/1	-	-	-	GR 10	0.25-1.0	-	GR 1/F	-	AW	-	-	Zf,F	4/5	-	-
A	3	7.5YR 3/2	L	15	40	GR 10	0.5-1.0	PO	GR 1/F	VFR	CW	-	-	1c 2f, f	0.5 4/3	-	-
Bw1	17	7.5YR 4/4	SL	15	55	GR 25	0.5-2.0	PO SS	SBK 1/M	FR	CW	-	-	Zm,f	4/3	-	-
Bw2	32	7.5YR 4/4	SL	15	55	GR 40	1.0-3.0	PO SS	SBK 1/M	FR	CW	-	-	Zf 1m	1.0 4/4	-	-
C	50	7.5YR 4/4	SL	2	75	GR 60	1-4	-	OM	F1	-	-	-	1f	-	-	-

Other Notes: More chromatic below A - Colluvium material; no wetness w/in 50"
Sandstone flags

TEST PIT DESCRIPTION

Soil Scientist: John C Roberts
 Field Assistant: Taylor Walter

Signature: John C Roberts

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P-089-160615-1506-5CR	Topographic Position:	Back slope	Parent material:	Colluvium over Residuum
Date:	6-16-2016	% Slope:	16%	Slope Aspect:	370
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey	Drainage Class:	WD	Depth to Water Table:	-
RETTEW Job #:	089962000	Depth to Refusal:	38"	Slope Failure or slip:	-
NRCS Soil Unit:	Paddy Knob - Mod Shap	Bedrock Type:	Sandstone	Dip Slope & Direction:	250 N
Mineralogy:	Mixed	Vegetation:	Stripe Maple, Red Maple, White Oak	Strike:	210

Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Maturity / Structure	Structure Type, Grade, and Size	Molt Consistence	Moisture Regime & Distribution	Redox Feature Color	Moisture Regime	Roots	Root Penetration/ M	Lab Sample ID	Notes
Do	1	5YR2/1	-	-	-	GR 10%	0.5-1.0	-	GR 1F	-	Aw	-	-	3yf 2f	4.5	-	-
A	2	7.5YR3/3	GR SIL	15	22	15 GR	0.5-1.5	PO SD	GR 1m	VFR	Aw	-	-	1f 2m	0.75 4.2	-	-
AB	4	7.5YR3/4	GR L	10	38	30 GR	0.5-2.0	PO SS	SBL 1m	VFR	Cw	-	-	1f 2f 4.4	0.75 4.4	-	-
Bw1	14	7.5YR4/4	GR L	20	30	65 GR	1-4.0	SP SS	SBL 1m	FR	Cw	-	-	1f 2f	1.25 4.4	-	-
Bw2	20	7.5YR4/4	GR L	22	40	65 GR	1-4.0	SP SS	SBL 1m	FR	Cw	-	-	1f	0.5 4.5	-	-
BC	30	7.5YR5/4	GR SL	15	55	65 GR	1-4.0	PO SD	OM → SBL 1m SBL 1m	VFR	Bw	-	-	1m 2.0	2.0	-	-
R	38	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Fin Prayed Sand Stone

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: John C Roberts
 Field Assistant: Taylor Walter

Signature: John C Roberts

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P-0899-160616-1550-5CR		Topographic Position:		Ridge / Back slope		Parent material:	Siderum								
Date:	6-16-2016		% Slope:		5%		Slope Aspect:	25° W								
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey		Drainage Class:		WD		Depth to Water Table:	—								
RETTEW Job #:	089962000		Depth to Refusal:		20		Slope Failure or slip:	—								
NRCS Soil Unit:	Paddy Knaps - Mod Shrdp		Bedrock Type:		Sandstone - fine gran		Dip Slope & Direction:	25° W								
Mineralogy:	mixed		Vegetation:		Striped Maple, White Hazel, Red Maple, Cherry		Strike:	181°								
USDA																
Horizon	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Structure Type, Grade, and Size	Moist Consistence	Moist Boundary Temperature & Direction	Redox Feature Color	Moist Feature Description	Roots	Rooter Penetration/ pH	Lab Sample ID	Notes
De	1.5	5YR2.5/1	—	—	—	GR 40	1-4	GR 1F	—	AW	—	—	3vF 2m	—	—	—
A	2.5	10YR2/2	VGR SL	15	60	GR	1-4	GR 1F	VFR	AW	—	—	2m, f	0.25	—	—
AB	5	10YR 3/3	VGR SL	15	65	GR 60	1-3.0	SBK 1m	VFR	AW	—	—	2m, f 1.0	0.125	—	—
Bw	20	10YR 5/8	VGR SL	18	65	GR 65	1-3.0	SBK 1m	FR	CW	—	—	2.0m, f 3f	0.75	—	—
R	20+	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Other Notes: Sandstone parent material

TEST PIT DESCRIPTION

Soil Scientist: Steve Dadio
 Field Assistant: Dave Skippa

Signature: *S. Dadio*

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1053

Test Pit ID:	P 090-160609-1005-5d	Topographic Position:	summit	Parent material:	Colluvium (frost mired) / residual
Date:	06/09/16	% Slope:	13	Slope Aspect:	170
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey	Drainage Class:	W/D	Depth to Water Table:	N/A
RETTEW Job #:	089962000	Depth to Refusal:	38	Slope Failure or slip:	N/A
NRCS Soil Unit:	reddyknob - med sheep	Bedrock Type:	sandstone	Dip Slope & Direction:	22° 150° strike: 60
Mineralogy:	siliceous	Vegetation:	northern red oak, hickory, black oak, witch hazel, red maple + chestnut spreading		

Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Rooting/stoniness	Structure Type, Grade, and Size	Mott. Consistence	Moisture Regime	Redox Feature Color	Redox Feature Description	Roots	Rock Fragmentation/ pH	Lab Sample ID	Notes
De	.5	7.5YR 2.5/1	-	-	-	gr 60	1-2	-	-	-	aw	-	-	M v F	<.25 4.25	S1	
A	3	10YR 3/2	1	10	40	gr 60	1-2	po so	1 f gr	vfr	cw	-	-	M F C C	.25 4.25	S2	
BE	6	10YR 4/4	sil	14	30	gr 60	1-2	ps	1 f s bk	fr	cw	-	-	M F C M	.25 4.25	S3	
Bw1	17	10YR 5/4	sil	15	25	ch 40	2-4	ps ss	1 m s bk	fr	cw	-	-	M F M V C	.25 4.75	S4	
Bw2	29	10YR 5/6	sil	15	25	ch 55	2-10	ps ss	1 f s bk	fr	aw	-	-	C F C M	.25 4.75	S5	
2C	38	10YR 5/6	sil	14	30	fr 90	6-12	ps ss	0 m	fr	aw	-	-	F M	.25 4.75	S6	
2R	38+																

Other Notes:

siliceous

TEST PIT DESCRIPTION

Soil Scientist: Steve Dedio
 Field Assistant: Dave Skippon

Signature: _____

[Signature]

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 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	Date:	Job Name:	RETTEW Job #:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	% Slope:	Drainage Class:	Depth to Refusal:	Bedrock Type:	Vegetation:	Parent material:	Slope Aspect:	Depth to Water Table:	Slope Failure or slip:	Dip Slope & Direction:	Roots:	Moisture Content:	Hydroboundary:	Redox Feature Color:	Redox Feature Description:	Lab Sample ID	Notes
POA1-160609-1225-5dd	06/09/16	Dominion - Atlantic Coast Pipeline Soil Survey	089962000	Mashup (B2G)	Mixed	backslope	57	linear convex	50"	51st stone	sugar maple, hickory, black oak, moosewood, striped maple	call/lres		N/A	N/A		M VF					S1	
																	CF					S2	
																	CF					S3	
																	CF					S4	
																	CF					S5	

Other Notes: _____

Strike/dip unable to be measured

with hazel

TEST PIT DESCRIPTION

Soil Scientist: Steve Dodic
 Field Assistant: Dave Skippon

Signature: S. Dodic

Test Pit ID:	Date:	Job Name:	RETTEW Job #:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	% Slope:	Drainage Class:	Depth to Refusal:	Bedrock Type:	Vegetation:	Parent Material:	Slope Aspect:	Depth to Water Table:	Slope Failure or Slip:	Dip Slope & Direction:	Roots	Rock Fragment Type & %	Rock Fragment Size (inches)	Structure Type, Grade, and Size	Molt Consistence	Moisture Regime	Redox Feature Color	Bedrock Features	Lab Sample ID	Notes
PO92-160609-1432-SDd	06/09/16	Dominion - Atlantic Coast Pipeline Soil Survey	089962000	Wekert - Berks	Mixed	backslope	50	WD	38	siltstone/sapstone	Northern red oaks, sugar maple, ash, white oak	horizontal	WD	N/A	N/A		M VF M F C M	40 45 60	2-6	PS SS 1 m sbk	Wf Wf fr	aw aw aw	-		100	

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Steve Dadio
 Field Assistant: Dave Stripon

Signature: _____

B. Dadio

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	Date:	Job Name:	RETTEW Job #:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	Parent Material:	Notes									
p093-160609-1531-sdd	06/09/16	Dominion - Atlantic Coast Pipeline Soil Survey	089962000	Waikaiti-Bairds Complex (535)	Mixed	Shoulder	coll/res										
						% Slope: 13	Slope Aspect: 180										
						Drainage Class: WD / SCD	Depth to Water Table: N/A										
						Depth to Refusal: 2 ft	Slope Failure or slip: N/A										
						Bedrock Type: sandstone	Dip Slope & Direction: 8 West										
						Vegetation: hickory	Strike: 220										
						USDA											
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	mineralogy	Structure Type, Grade, and Size	Moist Consistence	Moist Bulk Density	Redox Feature Color	Moist Feature Description	Roots	Product Neutron/100g/ pH	Lab Sample ID	Notes
Oa	2	7.5YR ^{2.5} /1	-	-	-	Ch 40	2-4	-	-	-	ew	-	-	M V F M F M	<.25 4.25	-	
A	4	7.5YR ^{2.5} /2	sil	16	10	Ch 40	2-4	PS	1f sbk	vfr	ow	-	-	M F C M	0.5 4.5	-	
Bw	19	7.5YR ⁵ /6	sil	20	10	Ch 45	2-6	PS SS	1msbk	fr	ow	-	-	C M C C C V C	1.0 4.5	-	
R	19+																

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Duane Trax
 Field Assistant: Jaylen Walter

Signature: 

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 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Structure Type, Grade, and Size	Moist Consistency	Soil Boundary Topography & Discontinuity	Redox Feature Color	Parent material:	Slope Aspect:	Depth to Water Table:	Slope Failure or Slip:	Dip Slope & Direction:	Roots	Rock Fragmentation/pt	Lab Sample ID	Notes	
P004-100609-1541-11T	0-09-2016	10YR 5/6	Siel	22	30	XHL 85%	0.25-12.0	SBL 1.2	FR	SA	-	-	N/A	N/A	N/A	10° W	-	-	-	hard to see	
																					55%
A	1-25	7.5YR 4/2	Siel	13	20	CH 25%	0.25-	GR 1.3	VFR	SA	-	-	3F 1.1m	-	-	-	-	-	-	-	many fragments on surface
Be	2.5-16	10YR 6/4	Siel	16	18	VCH 50%	2.0	SR 1.1	VFR	SC	-	-	2.1m	-	-	-	-	-	-	-	-
Bt1	10-18	10YR 6/6	Siel	23	21	XCH 100%	6.25-	SR 1.3	FR	SA	-	-	3m	-	-	-	-	-	-	-	-
Bt2	18-28	10YR 5/6	Siel	29	18	XCH 75%	8.0	SR 1.2	FR	SA	-	-	2.1m	-	-	-	-	-	-	-	-
2C	28-34	10YR 5/6	Siel	22	30	XHL 85%	0.25-12.0	SBL 1.2	FR	IA	-	-	1.1m	-	-	-	-	-	-	-	-
2R	34+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Juane Taux
 Field Assistant: Taylor Walker

Signature: 

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	Date:	Job Name:	RETTEW Job #:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	% Slope:	Drainage Class:	Depth to Refusal:	Bedrock Type:	Vegetation:	Parent material:	Slope Aspect:	Depth to Water Table:	Slope Failure or slip:	Dip Slope & Direction:	Redox Feature Color:	Redox Feature Description:	Roots:	Parent Material/PT	Lab Sample ID	Notes	
0095-160609-1357-DAT	06-09-2016	Dominion - Atlantic Coast Pipeline Soil Survey	089952000	WetKert-Berks Complex, V. Stony	Mixed	Shoalica (bony)	36%	Well Drained	30"	Sandstone	Rod Methyl Red Out, Hardstone, Clastic Ash	20° NE	N/A	N/A	19° N	51° E							
0e	0-1	5 ^{YR} 3/2	-	-	-	-	-	-	-	-	-	SA	-	-	-	-	-	-	4.5	S-1A			
0a	1-2	5 ^{YR} 3/1	-	-	-	-	-	-	-	-	-	SA	-	-	-	-	-	-	4.2	S-2A			
AE	2-4	5 ^{YR} 4/3	Si	B	10	VClt 40%	0.25-2.0	So	So	SQR	1.1	NVAL	UOA	-	-	-	-	2, F	0.25	S-3A			
Bw1	4-10	10 ^{YR} 6/4	SiL	13	22	VClt 50%	0.25-4.0	So	So	SQR	1.1	FR	SA	-	-	-	-	2, F	1.75	S-4A			
Bw2	10-19	10 ^{YR} 6/6	L	15	41	XcH 65%	0.25-8.0	PD	PD	SQR	1.2	FR	SA	-	-	-	-	3, M	2.0	S-5A			
C	19-30	10 ^{YR} 6/6	L	18	50	XcL 85%	0.5-12.0	So	So	SQR	1.2	FR	IA	-	-	-	-	2, M	1.5	S-5A			
R	30+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Hardstone Bedrock	

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Diane Trux
 Field Assistant: Taylor Walter

Signature: _____



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 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1053

Test Pit ID:	PO96-1601009-1223-DAT	Topographic Position:	SHOWER / TOP OF TRENCH	Parent material:	Bedrock / Residuum											
Date:	06-09-2016	% Slope:	4-7%	Slope Aspect:	180° SW											
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey	Drainage Class:	Some what excessively drained	Depth to Water Table:	N/A											
RETTEW Job #:	089962000	Depth to Refusal:	40"	Slope Failure or slip:	N/A											
NRCS Soil Unit:	Wellvent-Berkes Complex, Very stony	Bedrock Type:	Sandstone	Dip Slope & Direction:	12°											
Mineralogy:	Mixed	Vegetation:	Red Oak, White Oak, Ash, Red Maple, Quercus Oak	Strike:	232° W											
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Structure Type, Grade, and Size	Moist Consistence	Region Boundary Description	Redox Feature Color	Redox Feature Description	Roots	Rock Fragmentation/ pH	Lab Sample ID	Notes
Oe	0-0.5	5YR 2.5/1	-	-	-	-	-	-	-	SA	-	-	-	4.4	S-1A	Some flagstones on the surface
A	0.5-3	10YR 4/3	Sil	11	26	Qtz 25%	0.25-2.0	ln	Wn	SA	-	-	3F 2.1m, 1.6	0.5	S-2A	
BC	3-9	10YR 5/4	l	18	42	VeK 35%	0.25-4.0	SBK 1.1	Fn	SA	-	-	2.1F 2.1m, 1.5	4.5	S-3A	
B+1	9-15	10YR 5/4	l	24	45	XcK 60%	0.25-8.0	SBK 1.2	Fn	SA	-	-	2.2F 2.1m, 1.5	4.6	S-3B	
2B+2	15-29	10YR 5/4	dl	33	25	XcK 80%	0.25-12.0	SBK 2.3	Fn	IA	-	-	2.25 4.6	5-4A		
2BCt	29-40	10YR 5/4	Sil	36	15	XcK 95%	0.25-16.0	SBK 1,2	Fn	IA	-	-	4.2	5-5A		
2R	40+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Sandstone Bedrock

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Diane Truax
 Field Assistant: Taylor Walter

Signature: _____

RETTEW Associates, Inc.
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 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P-097-100609-1039-DAT										Topographic Position:	Summit		Parent material:	Residuum		
Date:	06-09-2016										% Slope:	10%		Slope Aspect:	110° E		
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey										Drainage Class:	Well drained		Depth to Water Table:	N/A		
RETTEW Job #:	089962000										Depth to Refusal:	27"		Slope Failure or slip:	N/A		
NRCS Soil Unit:	Weikert-Ricks Complex, v. stony										Bedrock Type:	Sandstone		Dip Slope & Direction:	18°		
Mineralogy:	Mixed										Vegetation:	Red Oak, walnut, Hawthorn, White Oak		Strike:	200° S		
USDA																	
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (Inches)	Moisture/ Stickiness	Structure Type, Grade, and Size	Moist Consistence	Rooting Boundary Topography & Disturbance	Redox Feature Color	Redox Feature Description	Roots	Moisture/ Stickiness	Lab Sample ID	Notes
De	0-15	5YR 3/1	-	-	-	-	-	-	-	-	-	-	-	3, F 2, M	-	S-1A	
A	1.5-3.0	7.5YR 4/2	Sil	14	14	Clk 15%	0.25-1.5	P0 50	GR 1, 3	VH	SA	-	-	2, M 1, C	0.25 4.4	S-2A S-2B	
BE	3-6	10YR 6/6	Sil	18	25	VHt 30%	0.25-3.0	P0 50	SR 1, 1	FR	SA	-	-	2, M 1, C	1.75 4.0	S-3A S-3B	
BE	6-14	7.5YR 5/6	Cl	29	23	XFL 65%	0.25-8.0	P5 50	SR 2, 2	FR	SA	-	-	1, M 1, C	3.5 4.5	S-4A S-4B	Clay shins
C	14-27	7.5YR 6/6	S	17	45	XFL 95%	0.25-10.0	P0 50	SR 1, 1	FR	IA	-	-	1, M	3.0 4.5	S-5A S-5B	Sandstone Bedrock
-R	27+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Other Notes:

TEST PIT DESCRIPTION
 Soil Scientist: D. Fenskemacher
 Field Assistant: Kathleen Harrison

Signature: Bruce J. Fenske

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
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 Fax: 717-394-1053

Test Pit ID:	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture/Soil Class	Structure Type, Grade, and Size	Mott. Consistence	Native Boundary Disturbance	Redox Feature Color	Water Feature Disturbance	Roots	Parent Material/Soil	Lab Sample ID	Notes
P-098-160609-1040-DEF	0-2	5YR 2.5-11	-	-	-	80% Shales	2-8	-	-	-	-	-	-	3T	Calverium	S1	Numerous surface gravel to boulder slabs
A	2-6.5	10YR 3/1	XGR SL	10	55	75% CB	2-8	Po	2M GR	VFR	CU	-	-	3T	-	S2	
								So									
Bw1	6.5-12	7.5YR 5/14	XGR SL	12	55	75% GR	1/4-8	Po	1G GR	VFR	CU	-	-	3F	-	S3	
								So									
2Bw2	12-36	10YR 5/14	VGR L	16	40	40% GR	1/4-6"	Po	1M GR	Ff	GW	-	-	2M	-	S4	
								So									
2BC	36-39+	10YR 5/14	VST L	16	43	58% Stones	1/4"->20"	Po	1W GR	Ff	-	-	-	1F	-	S5	
								So									

Other Notes:

Rocks in Bottom of hole are somewhat bedded and dip 30° NW and have 2" offset between sp. of beds
 Rock outcrops on ridge are dipping 10° NW, rock in bottom, refusal on boulder slabs
 Sandstone coarse fragments throughout, ~~fine~~ medium grained in upper, slightly fine grained in lower beds

TEST PIT DESCRIPTION

Soil Scientist: D Henskemacher
 Field Assistant: Max Dugan

Signature: [Signature]

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P-099-160609-1055-DET					Topographic Position:	Wad slope		Parent material:	Colluvium		
Date:	6/9/16					% Slope:	50%		Slope Aspect:	-		
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey					Drainage Class:	Well		Depth to Water Table:	-		
RETTEW Job #:	0389962000					Depth to Refusal:	58' Auger refusal		Slope Failure or slip:	-		
NRCS Soil Unit:	Wiltet-Belts complex (S3F)					Bedrock Type:	-		Dip Slope & Direction:	-		
Mineralogy:	Mixed					Vegetation:	Sugar maple, cherry, white snake root, grape vine					
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Structure Type, Grade, and Size	Molt Consistence	Moisture Boundary Topographic & Distances	Redox Feature Color	Notes
0e	0-15	2.5YR 2.5/1	-	-	-	-	-	-	-	-	-	-
A	1.5-3.5	10YR 2/2	S.L	18	22	15% CN	< 1/2"	2F5Rk VFC QW	VFC QW	-	-	2F, M 1c0
AB	3.5-6	7.5YR 4/4	S.L	19	25	15% CN	< 1/2"	1F5Rk VFC AW	VFC AW	-	-	2F, M 1c0
Bw1	6-22	7.5YR 5/4	S.L	22	28	20% Gnl	< 1/2"	1G5Rk VFC GW	VFC GW	-	-	2F, M 1c0
Bw2	22-52	10YR 5/4	S.L	22	20	38% Gnl	< 2"	1G5Rk VFC Fr	VFC Fr	-	-	1F
Bw3	52-58+	10YR 5/4	S.L	22	20	55% CN	1/2-3/4"	SP	-	-	-	-

Other Notes: Augered to 58" from 50" - Refusal on Rocks-Shale CoF

Shale CoF Throughout

TEST PIT DESCRIPTION

Soil Scientist: Dan Fenstermaker
 Field Assistant: Max Deegan

Signature: [Handwritten Signature]

RETTEW Associates, Inc.
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 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID: P-100-160609-1105-DEF Topographic Position: Ridge top Parent material: Residuum
 Date: 4/9 % Slope: 20% Slope Aspect: 35°
 Job Name: Dominion - Atlantic Coast Pipeline Soil Survey Drainage Class: well Depth to Water Table: -
 RETTEW Job #: 089962000 Depth to Refusal: 29' Slope Failure or slip: -
 NRCS Soil Unit: Berkshelert (G2) Bedrock Type: Shale, 1/8"-2" Beds Dip Slope & Direction: 18° NW Strike: 359°
 Mineralogy: Mixed Vegetation: Chastnut, Blueberry, Mt Laurel, Red maple

Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Bedrock/Inclusions	Structure Type, Grade, and Size	Molt Consistence	Moisture Boundary Temperature & Conductivity	Redox Feature Color	Redox Feature Description	Roots	Rock Fragmentation/pt	Lab Sample ID	Notes
Oe	0-8	2.51R 2.51I	-	-	-	-	-	-	2-2	-	-	-	-	-	4.4	S1	
A	8-4	7.51R 2.51I	CN SIL	14	28	30% CN	1-4"	PO SO	2MGR	UFR	AW	-	-	35 2M 1C	5.4	S2	Five grainy Red Sandstone Cat
Bw	4-16	10MR 5/4	CN SIL	16	10	20% CN	1/4-4"	SP SS	1M5Rk	FR	CW	-	-	25" 1C	0.75 4.8	S3	
Cr	16-29	10MR 5/4	-	-	-	99% CN	1/2-8"	-	Red bed rock	-	AW	-	-	2f	-	-	Bedded + fractured Rock w/ fines in between
R	29+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: DeFenstermacher
 Field Assistant: Wendy Dugan

Signature: Brian Stee

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P-101-160609-115-DEF		Topographic Position:	Upper Backslope		Parent material:	Colluvium over Residuum										
Date:	4/9/10		% Slope:	Well		Slope Aspect:	-										
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey		Drainage Class:	4"		Depth to Water Table:	-										
RETTEW Job #:	089962000		Bedrock Type:	Shale 1/2-2" thick		Slope Failure or slip:	-										
NRCS Soil Unit:	Balks-Weibert (OE)		Vegetation:	Chestnut oak, striped maple, Hickory, grass, white smoke root		Dip Slope & Direction:	10° NW										
Mineralogy:	mixed		USDA														
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Maturity/Stubble	Structure Type, Grade, and Size	Molt Consistence	Modern Boundary Disturbance	Redox Feature Color	Parent Feature Description	Roots	Field Resistance/ pH	Lab Sample ID	Notes
D _a	0-3	7.5 ^u 2.5 ^l	-	-	-	-	-	-	-	-	AW	-	-	25 1M	6.5	-	Thin Oe overlying
B _w	3-14	10 ^u 5 ^l	SIL	17	18	30% CN	2 1/2"	SP	MSBK	Fr	CW	-	-	3F/M 2C _o 2G/M	5.5	-	
B _{w2}	14-22	7.5 ^u 5 ^l	SIL	17	20	45% CN	2 4"	SS	MSBK	Fr	CW	-	-	2G/M	5.3	-	
C _c	22-41	7.5 ^u 5 ^l	XCN SIL	16	18	80% CB	2-8"	SP SS	MSBK	Fr	AW	-	-	2F 1M	4.6	-	
D _r	41+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: D. Fenstermacher
 Field Assistant: Max Degan

Signature: 

RETTW Associates, Inc.
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 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1053

Test Pit ID:	P-101A-160609-1605-DEF				Topographic Position:	nose slope		Parent material:	Residuum									
Date:	08/11/16				% Slope:	28%		Slope Aspect:	-									
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey				Drainage Class:	Somewhat excessively		Depth to Water Table:	-									
RETTW Job #:	089962000				Depth to Refusal:	30"		Slope Failure or slip:	-									
NRCS Soil Unit:	Bekes-weiker1 (6E2)				Bedrock Type:	Shale 1/2-2" thick		Dip Slope & Direction:	180 NW									
Mineralogy:	Mixed				Vegetation:	Chestnut oak, Red oak, Hickory, Blueberry, grass		Strike:	017									
USDA																		
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Rooting/ nodules	Structure Type, Grade, and Size	Moist Consistence	Moisture Regime & Distribution	Redox Feature Color	Root Feature Description	Roots	Root Penetration/ ft	Lab Sample ID	Notes	
0e	0-1	5YR 2.5/2	-	-	-	-	-	-	-	-	-	-	-	3F 2M	5.2	-	-	
A	1-2	10YR 3/2	SIL ^{VCN}	16	18	38% CN	4-2"	PO	2MGR	VFR	AW	-	-	3FM 2L	0.1	-	-	inner colluvial flow sandstone ccf
Bw	2-7.5	10YR 5/4	SIL ^{VCN}	18	16	41% CN	1/4-3"	SP	1MSBK	Fc	CW	-	-	3CM 2C	1.0	-	-	Shale ccf
Cc	7.5-13	10YR 5/4	-	-	-	99% CN	1/2-4"	-	-	-	AW	-	-	-	-	-	-	fractured rock with fines
R	13+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Other Notes:

13"

TEST PIT DESCRIPTION

Soil Scientist: John M. Mott
 Field Assistant: _____

Signature: [Handwritten Signature]

RETTM Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P-102-160613-1106-35W					Topographic Position:	SUMMIT					Parent material:	RESIDUUM				
Date:	6/13/16					% Slope:	3%					Slope Aspect:	94°				
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey					Drainage Class:	SOMEWHAT EXCESSIVE					Depth to Water Table:	-				
RETTM Job #:	089962000					Depth to Refusal:	18"					Slope Failure or slip:	-				
NRCS Soil Unit:	BPKC2-WEIKERT					Bedrock Type:	SILTSTONE					Dip Slope & Direction:	30NW (226) Strike: 236°				
Mineralogy:	MIXED					Vegetation:	CISTANT BARK RITCH RIDGE PLUMBERRY, LAUREL					USDA					
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Rooting/Stubble	Structure Type, Grade, and Size	Molt Consistence	Median Boulder Topographic Disturbance	Redox Feature Color	Redox Feature Description	Roots	Point Temperature/pH	Lab Sample ID	Notes
0e	0-2	4YR2.5/1	-	-	-	-	-	-	-	-	as	-	-	2-VF, F	4.5	-	
A	2-2.5	10YR2.5/1	SIL	13	20	10 CH	< 1	OP	1M3R	VER	am	-	-	2-VF, F M	0.25	-	
Bm	2.5-12	10YR5/6	VCH SIL	15	17	38 CH	1-3	OP SS	1M5BPK	FR	cw	-	-	2-F, M, F 1-C, VF	0.5 4.5	-	
Cc	12-18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
R	18+	SILTSTONE	-	-	-	BED ROCK	-	-	-	-	-	-	-	-	-	-	

Other Notes:

ON ROAD SUMMIT, 0-270, LARGE TREES Dying

TEST PIT DESCRIPTION

Soil Scientist: JONAN WALK
 Field Assistant: _____

Signature: [Handwritten Signature]

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P-103-160613-1111-JSW	Topographic Position:	BACKSCOPE	Parent material:	COCCUM OVER RESIDUUM
Date:	6/13/16	% Slope:	SILT	Slope Aspect:	145°
Job Name:	Domionion - Atlantic Coast Pipeline Soil Survey	Drainage Class:	WELL	Depth to Water Table:	-
RETTEW Job #:	089962000	Depth to Refusal:	33"	Slope Failure or slip:	BENT TREES
NRCS Soil Unit:	WEIKERT - BERKS	Bedrock Type:	SILTSTONE	Dip Slope & Direction:	29°NW (310°) Strike: 220°
Mineralogy:	MIXED	Vegetation:	HICKORY, MAPLE, CESTRUM OAK		

Horizon	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Maturity/ modulus	Structure Type, Grade, and Size	Molt Consistence	Median Boundary Temperature & Distribution	Redox Feature Color	Redox Feature Description	Roots	Rock Fragmentation/ pit	Lab Sample ID	Notes
0e	0'-1'	SILT 2.5/1	-	-	-	-	-	-	-	-	RS	-	3-V,F,F	-	5.5	-	
A	1'-3'	2.5/1/2.5/1	QR SIL	12	25	15 QR	<0.5	PO SO	1M, 1R	VER	CS	-	3-V,F,F 2-M	-	0.25	-	
AB	3'-6'	2.5/1/2.5/1	QR SIL	13	20	25 QR	<0.5	PO SO	2F, 5BK	FL	CM	-	3-V,F,F 2-M,C	-	0.5	-	
BE1	0'-3'	2.5/1/1/0	QR SIL	25	20	30 QR	<1	SS SP	2MSBK	FL	CS	-	3-F 1-C	-	0.5	-	CLAY SKINS
BE2	3'-22'	2.5/1/1/0	QR SIL	28	20	35 QR 20CM	<1	SS SP	2MSBK	FL	CM	-	3-F	-	1.0	-	CLAY SKINS SANDSTONE CHANNELS
2Bc	20' ³³	2.5/1/1/0	XCH SIL	22	18	30 30CH	<1	SO PO	1F, 5BK	FL	CM	-	2-F	-	0.5 5.0	-	SILTSTONE CHANNELS
2R	30'	SILT	STONE			BEDROCK											

Other Notes: BACKSCOPE LINEAR CONTAINS: GRAY SILTSTONE; SANDSTONE FLAYS ON SURFACE
 SMALL SANDSTONE OUTCROPS BETWEEN T-103A & T-103B

TEST PIT DESCRIPTION

Soil Scientist: JAMES WATT
 Field Assistant: _____

Signature: [Signature]

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1053

Test Pit ID:	P-104-160613-1400-JSN		Topographic Position:		Back Slope		Parent material:		COLUMBIUM OVER RESIDUUM								
Date:	6/13/16		% Slope:		45%		Slope Aspect:		27°								
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey		Drainage Class:		WELL		Depth to Water Table:		-								
RETTEW Job #:	089962000		Depth to Refusal:		46"		Slope Failure or slip:		FEW BENT TREES								
NRCS Soil Unit:	WIKBERT-BRKS		Bedrock Type:		SILTSTONE		Dip Slope & Direction:		-								
Mineralogy:	MIXED		Vegetation:						Strike: -								
USDA																	
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture/ Solids	Structure Type, Grade, and Size	Moist Consistence	Moist Density, Temperature & Odors	Redox Feature Color	Moist Feature Description	Roots	Product Temperature/ pH	Lab Sample ID	Notes
De	0-1	5YR2.5/1	-	-	-	-	-	-	-	-	as	-	-	3-VF, F	4.5	-	
A	1-2	10YR3/1	SIL	12	18	10 GR	< 1	PO	1 FHR	VFR	as	-	-	3-VF, F 1-C	< 0.25	-	
BE	2-9	10YR5/10	CH	17	15	16 CH	< 1	PO	1 MSBK	FR	CS	-	-	2-VF 3-F, M 2-C	0.5	-	
Bk	9-16	2.5YR5/10	VCH SIL	24	15	35 CH	< 1	SP	2 MSBK	FR	CN	-	-	2-F 1-M	0.5	-	
2Bc	16-46	7.5YR5/10	XCH SIL	20	20	85 CH	1-4	PO	1 FSBK	FR	aw	-	-	1-VF	0.75	-	
2R	46+	SILTSTONE				BEDROCK											

Other Notes:

BACKLUTE-LINER-CONCRETE

TEST PIT DESCRIPTION

Soil Scientist: JOHN W. A. H.
 Field Assistant: _____

Signature: gshuck

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	2-105-160613-1415-05W					Topographic Position:	BACKSLOPE					Parent material:	COCCUVIUM OVER RESIDUUM				
Date:	6/13/16					% Slope:	12%					Slope Aspect:	305°				
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey					Drainage Class:	SOMEWHAT EXCESSIVE					Depth to Water Table:	-				
RETTEW Job #:	089962000					Depth to Refusal:	23"					Slope Failure or slip:	-				
NRCS Soil Unit:	BEKRS-WEIKERT					Bedrock Type:	SILTSTONE					Dip Slope & Direction:	18°W (20) Strike: 180°				
Mineralogy:	MIXED					Vegetation:	LAVRELMAPLE, CHESTNUT OAK, BLUEBERRY					USDA					
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Rooting/ nodules	Structure Type, Grade, and Size	Mobility Consistence	Hydro Boundary Topography & Distances	Redox Feature Color	Redox Feature Description	Roots	Plant Penetration/ pH	Lab Sample ID	Notes
0e	0-3	5YR2.5/1	-	-	-	-	-	-	-	-	as	-	3-VF 2-F, M	4.5	-	-	
A	3-10	10YR5/1	SIL 11	15	10	GR	< 1	20 50	1M, 2K	VER	am	-	3-F, M	< 0.25	-	-	
Bm	10-19	10YR5/6	GR SIL	14	18	GR	< 1	PO SO	1M, 2K	CR	cm	-	2-F 3-M, C 1-C	0.5 5.3	-	-	SANDSTONE COF
2Bc	19-23	10YR5/6	XCU SIL	12	15	PO CU	1-3	PO SO	1E, 2K	FR	am	-	1-F	0.5	-	-	
2E	23+	SILTSTONE					BEDROCK										

Other Notes: BACKSLOPE / SUMMIT AREA

TEST PIT DESCRIPTION

Soil Scientist: David N. A. H.
 Field Assistant: _____

Signature: [Handwritten Signature]

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P-106-160613-1411-SSW				Topographic Position:	BACKSLOPE				Parent material:	COLUVIUM OVER RESIDUUM						
Date:	6/13/16				% Slope:	25%				Slope Aspect:	170°						
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey				Drainage Class:	WELL				Depth to Water Table:	-						
RETTEW Job #:	089962000				Depth to Refusal:	32"				Slope Failure or slip:	-						
NRCS Soil Unit:	BERK1 - WEIKERT				Bedrock Type:	SILTSTONE				Dip Slope & Direction:	18° N (ASS) Strike: 265°						
Mineralogy:	MIXED				Vegetation:	LICKERY, VA PINE, CHESTNUT OAK, BLUEBERRY				USDA							
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Muscle/Stubness	Structure Type, Grade, and Size	Molt Consistence	Major Boundary Topography & Distances	Redox Feature Color	Major Feature Description	Roots	Product Measurement/pt	Lab Sample ID	Notes
0E	0-2	5YR2.5/1	-	-	-	-	-	-	-	-	as	-	-	3-15" F 2-M	4.5	-	
A	2-3	10YR2.5/1	CH SIL	12	18	15 CH	1	PO	1 F P	HER	as	-	-	3-F 2-M	<0.25	-	SANDSTONE COF
BE	3-11	10YR5/6	CH SIL	14	18	20 CH	1	PO SO	1 M SBK	FR	as	-	-	2-F, M 1-C	0.5	-	SANDSTONE COF
Bt1	11-16	2.5YR5/6	VCU SIL	18	21	40 CH	<0.5	SP SS	2 M SBK	FR	CS	-	-	2-M, C	0.5	-	CLAY SKINS SANDSTONE COF
2Rt2	16-29	2.5YR5/6	NCH SIL	19	20	55 CH	<0.5	SP SS	2 F SBK	FR	as	-	-	2-F, M	4.5	-	CLAY SKINS
2C1	26-32	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
2R	32+	SILTSTONE	SILTSTONE			BEDROCK											

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Steve Dadio
 Field Assistant: Stephanie Moraca

Signature: B Dadio

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	p107-120613 - 1053 - sdd		Topographic Position:		Backslope		Parent material:											
Date:	06/13/16		% Slope:		36		Slope Aspect:		112°									
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey		Drainage Class:		WD		Depth to Water Table:		N/A									
RETTEW Job #:	089962000		Depth to Refusal:		32		Slope Failure or slip:		N/A									
NRCS Soil Unit:	Wicker Beck		Bedrock Type:		fine ground sand stone		Dip Slope & Direction:		21° N									
Mineralogy:	M.xed		Vegetation:		chestnut oak mountain laurel, white pine, virginia pine				70°									
USDA																		
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture/ Ashless	Structure Type, Grade, and Size	Moist Condition	Median Boundary Topography & Orientation	Redox Feature Color	Redox Feature Description	Roots	Moist Temperature/ pH	Lab Sample ID	Notes	
Oe	3	5YR 2.5/1	-	-	-	25 gf	1-4	-	-	-	aw	-	-	Mf	<.25	-		
A	4	7.5YR 3/2	sil	16	12	25	1-4	-	1fgf	vfr	aw	-	-	Cf	5.25	-		
								PS										
Bw	22	7.5YR 6/6	sil	18	10	55 Ch	2-4	PS	1fslx	fr	aw	-	-	Ch	1.0	-		
								SS										
ZR	32	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Steve Dadio
Field Assistant: Stephanie Horaca

Signature: _____

S. Dadio

RETTEW Associates, Inc.
3020 Columbia Avenue
Lancaster, PA 17603
Phone: 717-394-3721
Fax: 717-394-1063

Test Pit ID:	P106-B0613-1217-5dd				Topographic Position:	top slope / summit											
Date:	06/13/16				% Slope:	11%											
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey				Drainage Class:	SE 0											
RETTEW Job #:	089962000				Depth to Refusal:	32											
NRCS Soil Unit:	Wellkert - berks				Bedrock Type:	fine grained sandstone											
Mineralogy:	Mixed				Vegetation:	Chestnut oak, mountain laurel, virginia pine, red maple											
USDA																	
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Rooting/ridges	Structure Type, Grade, and Size	Moist Consistence	Rooting Boundary & Thickness	Redox Feature Color	Rooting Feature Description	Roots	Product Temperature/ pH	Lab Sample ID	Notes
A	2.5	7.5YR 2.5/1	silt	16	15	ch 30	1-2	-	1 fgs	vfr	cw	-	-	CF	4.25	-	
								PS									
Bw	14	7.5YR 5/6	silt	19	10	ch 60	1-4	SS	1 msbk	fr	aw	-	-	CM	5.25	-	
								PS									
2Cr	32	-	-	-	-	-	-	-	-	-	aw	-	-	FM	-	-	
								-									
2R	32+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
								-									

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Steve Dadio
 Field Assistant: Stephanie Maraca

Signature: _____

B Dadio

Test Pit ID:	Date:	Job Name:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	Drainage Class:	Depth to Refusal:	Bedrock Type:	Vegetation:	Parent material:	Slope Aspect:	Depth to Water Table:	Slope Failure or slip:	Dip Slope & Direction:	Roots	Moisture Content	Structure Type, Grade, and Size	Musky/ sodden	Rock Fragment Size (inches)	Rock Fragment Type & %	% sand	% clay	Texture Class	Matrix Color	Depth in Inches	Horizon
P104-160613-1321-5dd	06/13/16	Dominion - Atlantic Coast Pipeline Soil Survey	089962000	Mixed	backstop	45 + (S3 NRCS-VOL) (CLAYSTONE)	N/D	58' large rocks	red maple, sassafras, virginia maple	colluvium	96°	N/A	N/A	-	MH	-	1 fgr	PS	.5-2	ch 40	-	-	5YR 2.5/1	3	De	
															MH	-	2 m sdt	PS	.5-4	ch 45	10	22	10YR 5/6	24	Bt1	
															MH	-	1 fgr	SS	.5-2	ch 40	10	16	7.5YR 3/2	6	A	
															MH	-	1 f sdt	SS	.5-2	ch 55	12	20	10YR 5/6	40	Bt2	
															MH	-	1 f sdt	SS	.5-2	ch 80	15	18	10YR 5/4	54	2Bc	

Other Notes: _____

Hand-dug with spade from 50-58

TEST PIT DESCRIPTION

Soil Scientist: Steve Dadić
 Field Assistant: Stephanie Maraca

Signature: [Signature]

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-594-3721
 Fax: 717-594-1063

Test Pit ID: P110-160613-1503-50d Topographic Position: lower b/s/beam
 Date: 06/13/16 % Slope: 16
 Job Name: Dominion - Atlantic Coast Pipeline Soil Survey Drainage Class: MWD
 RETTEW Job #: 089962000 Depth to Refusal: N/A
 NCRS Soil Unit: shelcks - berks Bedrock Type: siltstone
 Mineralogy: Mixed Vegetation: red maple, ferns

Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Stability/Indurability	Structure Type, Grade, and Size	Moist Consistence	Horizon Boundary Topography & Distances	Redox Feature Color	Major Feature Description	Roots	Product Weight/Volume/pt	Lab Sample ID	Notes
0e	3	7.5YR 2.5/1	-	-	-	20gr 20	1-4	-	-	-	aw	-	-	MVF MF MH	4.25 5.25	S1	
A	6	7.5YR 3/2	S.11	16	15	gr	1-4	PS SS	1 f gr	vfr	aw	-	-	MF CM	0.5 5.25	S2	
B+1	24	10YR 5/6	S.11	22	18	30 gr	1-4	PS SS	2msbk	fr	CW	-	-	CF EH	1.5 4.5	S3	
B+2	32	10YR 5/6	S.11	25	18	35 gr	5-1	PS SS	2msbk	fr	CW	-	-	FF	2.0 4.5	S4	
ZB+3	50	7.5YR 5/6	S.11	27	10	45 ch	.5-2	PS SS	1 copr	fi	-	7.5YR 5/6 7.5YR 6/3	cmf cmd	FM	2.5 4.75	S5	

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Steve Radio
 Field Assistant: Stephanie Moraca

Signature: B. Oatis

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	Date:	Job Name:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	% Slope:	Drainage Class:	Depth to Refusal:	Bedrock Type:	Vegetation:	USDA	Parent Material:	Slope Aspect:	Depth to Water Table:	Slope Failure or Slip:	Dip Slope & Direction:	Roots	Podzol Reaction/ pH	Lab Sample ID	Notes
P111-160613-1602-5dd	06/13/16	Dominion - Atlantic Coast Pipeline Soil Survey	089962000	Macgou - Berts	Backslope	52	wD	N/A	silt stone	red maple, hemlock		colluvium		N/A	N/A		CF CM CC	4.25 5.2	-	
A	7	7.5YR 3/2	sil	16	18	30	ch	1-4	-	1fgr	wfr	aw	-	-	-	-	CF CM CC	2.25 5.1	-	
B+1	28	2.5Y 6/6	sil	20	18	70	ch	3-6	-	1f-sbx	fr	cw	-	-	-	-	CF CM CC	1.0 4.7	-	
B+2	40	2.5Y 5/6	sil	22	18	40	ch	3-6	-	1f-sbx	fr	cw	-	-	-	-	FF FC	3.25 4.7	-	
2B+3	52	10YR 5/6	sil			40	ch	2-4	-	1f-sbx	fr	-	-	-	-	-	FC	2.75 4.6	-	

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: John C Roberts
 Field Assistant: Taylor Walter

Signature: _____

John C Roberts

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1053

Test Pit ID:	Date:	Job Name:	RETTEW Job #:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	Drainage Class:	Depth to Refusal:	Bedrock Type:	Vegetation:	Parent material:	Slope Aspect:	Depth to Water Table:	Slope Failure or Slip:	Dip Slope & Direction:	Roots	Moisture Content	Lab Sample ID	Notes	
D-112-160613-1405	6-13-2016	Dornton - Atlantic Coast Pipeline Soil Survey	089962000	Wellerent - Berks	Mixed	Lower Shoulder Slope	Well	34"	Sand shale / Shale	White Pine, Chestnut Oak, Hemlock, White Oak	Coll / Rosellum	233	-	-	60 to 65	326				

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: John C. Roberts

Field Assistant: Taylor Walter

Signature: John C. Roberts

RETTEW Associates, Inc.
3020 Columbia Avenue
Lancaster, PA 17603
Phone: 717-394-3721
Fax: 717-394-1063

Test Pit ID:	Date:	Job Name:	RETTEW Job #:	NRCS Soil Unit:	M Mineralogy:	Topographic Position:	% Slope:	Drainage Class:	Depth to Refusal:	Bedrock Type:	Vegetation:	Parent material:	Slope Aspect:	Depth to Water Table:	Slope Failure or slip:	Dip Slope & Direction:	Roots	Parent Permeability/ pH	Lab Sample ID	Notes
P-113-160613-1438-0CR	6-13-2016	Dominion - Atlantic Coast Pipeline Soil Survey	089962000	Wekivet - Berks	Mixed	Summit	10%	SED	14	Sandstone / Shale	White Pine, Chestnut Oak	Red Maple, Blackberry	Residual	152°		60° S	2 ft			
A	1.5	10YR 4/2	SIL	13	10	0.25-0.5											2 ft	0.5		
BA	3	10YR 5/6	SIL	15	25	0.5-1.5											2 ft	0.75		
CR	14	10YR 5/6	SIL	15	20	1-5											2 ft			
R	14																			

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: John C. Roberts
 Field Assistant: Taylor Walter

Signature: _____

John C. Roberts

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P-114-1160613-1325-5CR		Topographic Position:		Torslope / Flood plain		Parent material:		colluvium over residuum								
Date:	6-13-2016		% Slope:	15		Depth to Refusal:	17		Slope Aspect:	101°							
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey		Drainage Class:	SSB		Depth to Water Table:	-		Depth to Water Table:	-							
RETTEW Job #:	089962000		Bedrock Type:	-		Slope Failure or slip:	-		Slope Failure or slip:	-							
NRCS Soil Unit:	Maccona		Vegetation:	Hop hunkerum, Green Ash, White hoad, Tulip Poplar, Red Maple		USDA	-		Strike:	-							
Mineralogy:	Mixed																
Horizon	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Rooting/Structure	Structure Type, Grade, and Size	Moist Consistence	Moisture Regime & Distribution	Redox Feature Color	Redox Feature Description	Roots	Rock Fragmentation/pt	Lab Sample ID	Notes
Da	0.5	5YR 2.5/1	SIL	15	18	GR 10	1.25-1.0	-	-	VFR	GW	-	-	3m	4.2	S1	
A	3	10YR 3/2	SIL	15	18	UGR 60	0.5-2.0	Pd 50	GR 1m	FR	CW	-	-	2.5 3f	4.7	S2	
AB	9	10YR 4/4	SIL	17	20	UGR 70	0.75-4.0	Pd 35	SBC 1m	FR	GW	-	-	3m	4.5	S3	
Bw	17	10YR 5/6	SIL	19	22	UGR 70	0.25-3.0	SP 55	SBC 1m	FR	CW	-	-	2m 1f 2co	4.3	S4	
R	17+	10YR 5/6	SIL	19	22	UGR 70	0.25-3.0	SP 55	SBC 1m	-	-	-	-	1f	-	-	

Other Notes: Large Cobble in pit. No soil witness to 17"

TEST PIT DESCRIPTION

Soil Scientists: John C Roberts

Field Assistant: Taylor Walters

Signature: John C Roberts

RETTEW Associates, Inc.
3020 Columbia Avenue
Lancaster, PA 17603
Phone: 717-394-3721
Fax: 717-394-1053

Test Pit ID:	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture/Structure	Structure Type, Grade, and Size	Moist Consistence	Redox Boundary Temperature & Indications	Redox Feature Color	Parent Material:	Slope Aspect:	Depth to Water Table:	Slope Failure or slip:	Dip Slope & Direction:	Roots	Moisture/Structure	Lab Sample ID	Notes	
P-115-160613-1227-5CR													Bark slope									
Date: 6-13-2016													50% WD									
Job Name: Dominion - Atlantic Coast Pipeline Soil Survey													Sandstone / shale									
RETTEW Job #: 089962000													White Pine / Chestnut									
NRCS Soil Unit: Weichert - Berks													OAK / Chestnut									
Miningology: Mixed													USA									
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture/Structure	Structure Type, Grade, and Size	Moist Consistence	Redox Boundary Temperature & Indications	Redox Feature Color	Parent Material:	Slope Aspect:	Depth to Water Table:	Slope Failure or slip:	Dip Slope & Direction:	Roots	Moisture/Structure	Lab Sample ID	Notes	
Oe	0.5	7.5YR 2.5/1				GR 15	0.25-0.75			VFR	AU							2m ZF				
A	1.0	10YR 3/2	SIL	12	25	20 GR 6R	0.25-0.5			VFR	CW							2m ZF				
BA	4	10YR 5/4	SIL	14	28	30 GR 6R	0.25-1.5			FR	CW							2m ZF				
Be1	11	10YR 5/6	L	20	30	40 CN 40	0.5-2.0			FR	CW							1m 2m 2.0				
Be2	25	10YR 5/6	L	20	28	60/10 CN/FR	0.5-3.0			FR	CW							2F 1.0				Large flagstones randomly positioned
BC	34	10YR 6/6	L	12	40	75 GR 6R	1-2.0			FR	CW							1F				
C	50*	10YR 6/6				95 XFR	1-6"			FR								1F				


Other Notes: Colluvium throughout pit Flag stones beginning around 11"

TEST PIT DESCRIPTION

Soil Scientist: John C Roberts

Field Assistant: Taylor Walter

Signature: _____



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Fax: 717-394-1053

Test Pit ID:	Date:		Job Name:	RETTEW Job #:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	% Slope:	Drainage Class:	Depth to Refusal:	Bedrock Type:	Vegetation:	Parent material:	Slope Aspect:	Depth to Water Table:	Slope Failure or slip:	Dip Slope & Direction:	Roots:	Moisture Content/ pH	Lab Sample ID	Notes	
P-116-160613-1016-508	06-13-2016		Dominion - Atlantic Coast Pipeline Soil Survey	089962000	UeKert - Rocks	mixed	Back slope	50%	MD	40	Bedrock	White pine / Hickory / Rhododendron / Red Maple						3F	0.25 4.5			
A	2	10YR 3/2	SIL	14	15	GR 15	0.5-2.0	RD	1M GR	VFR	CW							2F 2m	0.25 4.5			
BA	4	10YR 3/3	SIL	15	15	GR 15	0.5-1.0	PD SS	1M SGR	FR	CW							2F 2m	0.5 4.7			
Bt1	11	10YR 5/6	SL	18	16	GR 20	10-3.0	SP SS	1M SGR	FR	GW							3M 200	0.5 4.5			
Bt2	23	10YR 5/6	SL	20	16	CN 40	10-4.0	SP SS	1M SGR	FR	GW							2m 100	1.6 4.5			
4C	40	10YR 5/6	SIL	10	25	*FC 90	1-6.0	SO SS	0, M	FR	CI							1F 1m	— 5.0		Fines in cracks	
4R	40+																					

Other Notes: Shale / Sandstone Rock @ 40"

5'

TEST PIT DESCRIPTION

Soil Scientist: M. WOOD
 Field Assistant: M. DUGAN

Signature: MWC

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 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID: P117-16 0616-1780-MGW Topographic Position: UPPER SHOULDER SLOPE Parent material: RESIDUUM
 Date: 6/16/16 % Slope: 18 Slope Aspect: 180
 Job Name: Dominion - Atlantic Coast Pipeline Soil Survey Drainage Class: Well Drained Depth to Water Table: > 29
 RETTEW Job #: 089962000 Depth to Refusal: 29 Slope Failure or slip: -
 NRCS Soil Unit: SHELDONIA-BERKS Bedrock Type: 29 Dip Slope & Direction: 17 S
 Mineralogy: MSPd Vegetation: See Below USDA

Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture/Structure	Structure Type, Grade, and Size	Moist Consistence	Median Boundary Topography & Disturbance	Redox Feature Color	Redox Feature Description	Roots	Product Placement/Inch	Lab Sample ID	Notes
0-1	0e	7.5 YR 3/2	-	-	-	-	-	-	-	-	AS	-	-	3 F-VF 1 M-LD	5.4	-	-
1-14	Bw	10YR 5/6	VCN PDR	9	46	GR 40	< 2.5"	PD S0	IF S0K	FL	CW	-	-	2 F-VF 1 M-LD	1.75 5.2	-	-
14-29	Cr	10YR 5/6	VCN S1	9	55	GR 80%	< 6.00"	PD S0	IF S0K	FA	CW	-	-	2 F-VF 1 M-LD	5.2	-	-
29+	R	-	-	-	-	-	-	-	OM	-	-	-	-	-	-	-	-

Other Notes: VEG: MAPLE, TULIP POPLAR, HICKORY, WHITE OAK (SPARSE HENG LAYER)

TEST PIT DESCRIPTION

Soil Scientist: M. WOOD
 Field Assistant: M. BUGAN

Signature: [Signature]

RETTEW Associates, Inc.
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 Fax: 717-394-1069

Test Pit ID:	<u>P18-060616-1030-MGW</u>	Topographic Position:	<u>LAT SLOPE LINEAN</u>	Parent material:	<u>COLUVIUM / REGIUM</u>
Date:	<u>6/11/16</u>	% Slope:	<u>58</u>	Slope Aspect:	<u>50</u>
Job Name:	<u>Dominion - Atlantic Coast Pipeline Soil Survey</u>	Drainage Class:	<u>SEB</u>	Depth to Water Table:	<u>>32</u>
RETTEW Job #:	<u>089962000</u>	Depth to Refusal:	<u>32</u>	Slope Failure or slip:	
NRCS Soil Unit:	<u>WEIKROT-BRKS-ROUGH</u>	Bedrock Type:	<u>SAND STONE</u>	Dip Slope & Direction:	<u>38°N</u>
Mineralogy:	<u>MIXED</u>	Vegetation:	<u>50% BROWN</u>	Strike:	<u>272</u>

Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture/Structure	Structure Type, Grade, and Size	Molt Consistence	Moist Boundary Description	Redox Feature Color	Redox Feature Description	Roots	Rooter Penetration/ft	Lab Sample ID	Notes
0-2	0	7.5R2/2	-	-	-	-	-	-	-	-	AS	-	-	3F-VF 2M-CO	6.5	S1	
2-3	A	10YR2/2	5F ^{GR}	10	47	GN 20	<1.0	P0 S0	1VF GR	VFA	CIL	-	-	3F-VF 2M-CO	0.25 5.8	S2	
3-8	Bw1	10YR4/4	5F ^{GR}	12	55	GN 40	<1.5	P0 S0	1VF SBK=GN	VFA	CW	-	-	3F-VF 1M-CO	0.25 5.5	S3	
8-12	Bw2	10YR5/6	5F ^{GR}	12	55	GN 45	<2.5	P0 S1	1VF SBK	FR	CW	-	-	1F-VF 1M-CO	0.50 5.5	S4	
12-25	Bw3	10YR5/6	5F ^{GR}	12	55	GN 65	<6.0	P0 S0	1+ SBK	FR	CW	-	-	1F-VF 1M-CO	0.75 5.4	S5	
25-32	C1	10YR5/6	5F ^{GR}	12	55	GN 75%	<6.0	P0 S0	DA	-	-	-	-	1M-CO	-		
32+	R																

Other Notes: VEG: TUSSOCK, BIRCH, STRIPED MAPLE, XMAS FERN

TEST PIT DESCRIPTION

Soil Scientist: M. WOOD

Field Assistant: M. DUGAN

Signature: M. Wood

RETTEW Associates, Inc.
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Lancaster, PA 17603
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Fax: 717-394-1063

Test Pit ID:	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Structure Type, Grade, and Size	Moist. Consistency	Adhesion, Rooting & Desiccation	Redox Feature Color	Parent Material: Slope Aspect:	Depth to Water Table:	Slope Failure or slip:	Dip Slope & Direction:	Roots	Proctor (moisture) %	Lab Sample ID	Notes
P119-16061C-102D-MGW																			
Date: 7/11/16																			
Job Name: Dominion - Atlantic Coast Pipeline Soil Survey																			
RETTEW Job #: 089962000																			
NRCS Soil Unit: WEIVENT-BECKS-ROUGH																			
Mineralogy: MIXED																			
USDA										Vegetation: <u>SEE BELOW</u>									
Topographic Position: <u>LAT LOWER SLOPE</u>										Parent material: <u>COLUVIUM / RESIDUAL</u>									
% Slope: <u>43</u>										Slope Aspect: <u>S9</u>									
Drainage Class: <u>WD</u>										Depth to Water Table: <u>>19</u>									
Depth to Refusal: <u>19"</u>										Slope Failure or slip: <u>-</u>									
Bedrock Type: <u>3' 19"</u>										Dip Slope & Direction: <u>-</u>									
0-1	0e	7.5 YR 3/2	-	-	-	-	-	-	-	AS	-	-	-	-	-	3 VF-F 2 OD-M	-		
1-2	A	10 YR 3/3	5.1	12	40	GR 2.15	2.10"	P0 1 VF 5.6 GRD	VFR	CW	-	-	-	-	-	3 VF-F 2 OD-M	0.5		
2-5	Bw ₁	10 YR 5/1	5.1	12	40	GR 30%	2.40"	Pb 1 VF 5.6 SDR-CL	VH	CW	-	-	-	-	-	2 VF-F 2 OD-M	1.5		
5-12	Bw ₂	10 YR 5/6	5.1	12	52	GR 65	2.12"	Pb 1 M 5.0 SBL	FN	CW	-	-	-	-	-	2 VF-F 1 CO-M	1.5 4.8		
12-19	Q5	10 YR 5/1	5.1	12	52	CR 80%		Pb 5.0 DM	-	-	-	-	-	-	-	1 VF-F 1 CO-M	-		

Other Notes:

VEG: HEMLOCK, JUNIPER, RED MAPLE, BIRCH

TEST PIT DESCRIPTION

Soil Scientist: M. Wood

Field Assistant: M. DUSAN

Signature: M. Wood

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Test Pit ID:	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Structure Type, Grade, and Size	Moist Consistence	Redox Boundary Indicators	Redox Feature Color	Parent Material	Slope Aspect	Depth to Water Table	Slope Failure or slip:	Dip Slope & Direction:	Strike:	Notes
P120-160116-1010-MGW	6-17-16																	
Date:	Dominion - Atlantic Coast Pipeline Soil Survey																	
Job Name:	RETTEW Job #: 089962000																	
NRCS Soil Unit:	MACOVEC HAMMONY																	
Mineralogy:	MIXED																	
USDA													HEMLOCK WITCH HAZEL, REDMAPLE, HICKORY, STRIPED MAPLE					
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Structure Type, Grade, and Size	Moist Consistence	Redox Boundary Indicators	Redox Feature Color	Parent Material	Slope Aspect	Depth to Water Table	Slope Failure or slip:	Dip Slope & Direction:	Strike:	Notes
De	0-1	7.5YR 2/2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A	1-3	10YR 3/3	S 1.1	18	21	GR 20%	< 2.0"	WF GR	HR	CS	-	-	-	-	-	-	-	-
Bw ₁	3-9	10YR 4/4	S 1.1	20	30	GR 20%	< 2.0"	2F SAK	FR	CW	-	-	-	-	-	-	-	-
Bw ₂	9-30	10YR 4/4	XGR S 1.1	20	42	GR 65	< 8.0"	2F SAK	FR	CW	-	-	-	-	-	-	-	-

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: M. Wood
 Field Assistant: M. Bugani

Signature: M. Wood

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Test Pit ID:	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Structure Type, Grade, and Size	Mott	Redox Feature Color	Roots	Lab Sample ID	Notes			
P20A-160610-1225-M&W	6/17/16	7.5YR 2/2	S.1	16	30	GR 5%	20.5"	1VFR GR	A5	-	3F-VF 2M-CO	-	-			
														Topographic Position: <u>NOSE SLOPE</u>	Moist Consistence: <u>AH</u>	Parent Material: <u>COLLUVIUM / RESIDUUM</u>
														Vegetation: <u>HEMLOCK, WHITE BARK, RED MAPLE</u>	Bedrock Type: <u>-</u>	Slope Aspect: <u>?</u>
Job Name: <u>Dominion - Atlantic Coast Pipeline Soil Survey</u>	NRCS Soil Unit: <u>MACDUE CHANNELRY</u>	Mineralogy: <u>MIXED</u>	Drainage Class: <u>WD</u>	Depth to Refusal: <u>30"</u>	Dip Slope & Direction: <u>-</u>	Strike: <u>-</u>	Soil Slope: <u>30°</u>	Depth to Water Table: <u>230"</u>	Slope Failure or slip: <u>-</u>	Parent Material: <u>COLLUVIUM / RESIDUUM</u>	Slope Aspect: <u>?</u>	Moist Consistence: <u>AH</u>	Parent Material: <u>COLLUVIUM / RESIDUUM</u>			
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Structure Type, Grade, and Size	Mott	Redox Feature Color	Roots	Lab Sample ID	Notes			
De	0-1	7.5YR 2/2	-	-	-	-	-	-	-	-	-	-	-			
A	1-1.5	10YR 6/4	S.1	16	30	GR 5%	20.5"	1VFR GR	A5	-	3F-VF 2M-CO	-	-			
														Moist Consistence: <u>AH</u>	Parent Material: <u>COLLUVIUM / RESIDUUM</u>	
Bw	1.5-14	10YR 6/4	S.1	18	33	GR 30%	25"	2F SBR	FR	GM	2F-VF 1M-CO 1VC	-	-			
														Moist Consistence: <u>FR</u>	Parent Material: <u>COLLUVIUM / RESIDUUM</u>	
Bc	14-30	10YR 6/4	XGR S.1	18	33	GR 65%	28"	2F SBR	FR	CW	1F-VF 1M-CO 1VC	-	-			
														Moist Consistence: <u>FR</u>	Parent Material: <u>COLLUVIUM / RESIDUUM</u>	

Other Notes: Refusal on coarse fragments

TEST PIT DESCRIPTION

Soil Scientist: M. WOODS
 Field Assistant: M. DUGAN

Signature: M. Woods

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Test Pit ID: P121-160616-0950-MGW Topographic Position: FLORBLAIN Parent material: ALLUVIAL / COLLUVIAL
 Date: 6/17/16 % Slope: 3 Slope Aspect: 183
 Job Name: Dominion - Atlantic Coast Pipeline Soil Survey Drainage Class: ~~AWD~~ Well drained Depth to Water Table: 217"
 RETTEW Job #: 089962000 Depth to Refusal: 17 Slope Failure or slip: -
 NCRS Soil Unit: MACOYE CHANUSKI Bedrock Type: - Dip Slope & Direction: -
 Mineralogy: MIXED Vegetation: SEE BELOW USDA

Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Rooting/ nodules	Structure Type, Grade, and Size	Molt Confidence	Nation Boundary & Disturbance	Redox Feature Color	Redox Feature Description	Roots	Moisture/ pH	Lab Sample ID	Notes
A	1-3	10YR 3/4	1	14	27	GR 8%	<0.5"	PO 56	1 VF GR	VHR	CS	-	-	2F-VF 1M-CO	0.25	S1	
C1	3-7	10YR 4/4	5/1	21	12	GR 50%	<0.5"	PO 50	2 VF GR	FI	CW	-	-	2F VF 2 CO-M 1 VC	1.25 / 4.9	S3	
C2	7-17	10YR 5/4	X6R 1	12	44	GR 65	<1/2"	PO 50	2 F 2 VF 2 GR	FI	CW	-	-	2 F / VF 1 CO-M 1 VAD	6.75 / 5.2	S4	
	17-																

Other Notes: WHITE RING RED MAPLE, HEMLOCK, HICKORY, GREEN ASH STRIPED MAPLE, PAM PAWS

TEST PIT DESCRIPTION

Soil Scientist: M. Wood
 Field Assistant: M. DUGAN

Signature: M. Wood

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 Phone: 717-396-3721
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Test Pit ID:	Date: <u>7-12-16</u>				Topographic Position:	Parent material:		Notes								
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey				% Slope:	Slope Aspect:										
RETTEW Job #:	089962000				Drainage Class:	Depth to Water Table:										
NRCS Soil Unit:	<u>W8SCLCt - GCLVS - R0VCH</u>				Depth to Refusal:	Slope Failure or slip:										
Mineralogy:	<u>MIXED</u>				Bedrock Type:	Dip Slope & Direction:										
					Vegetation:	SEE BELOW										
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Structure Type, Grade, and Size	Moist Consistence	Reaction Boundary (Depth & Description)	Redox Feature Color	Redox Feature Description	Roots	Moist Permeability (mm)	Lab Sample ID	Notes
De	0-3	7.5YR 3/2	-	-	-	-	-	-	-	-	-	-	3 VF+ 2 M-CO	-	-	-
AB	3-5	10YR 6/3	SRL	9	40	GL 215%	<1.0"	1 VF 6/R	VHL	CW	-	-	3 VF-E 2 M-CO	0.25 4.5	-	-
Bw	5-14	10YR 6/4	S	11	50	GL 35%	<1.5"	1 W SRV	HL	CW	-	-	2 VF-F 1 M-CO	1.25 4.8	-	-
Cr	14-32	10YR 6/4	S	11	50	GL 80%	<1.2"	OM	-	CW	-	-	2 VF-F 1 M-CO	4.8	-	-
R	32+															

Other Notes: VEG. MTN LAUREL, HICKORY, BLACK GUM, HUCKLEBERRY, WHITE PINE, WHITE OAK

TEST PIT DESCRIPTION

Soil Scientist: M Wood S. Pardo
 Field Assistant: M DUGAN R. Pardo

Signature: 

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 Lancaster, PA 17603
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 Fax: 717-394-1063

Test Pit ID:	Date:	Job Name:	RETTEW Job #:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	% Slope:	Drainage Class:	Depth to Refusal:	Bedrock Type:	Vegetation:	Parent material:	Slope Aspect:	Depth to Water Table:	Slope Failure or Slip:	Dip Slope & Direction:	Roots	Lab Sample ID	Notes		
P123-060615-1625-MGW	6/15/16	Dominion - Atlantic Coast Pipeline Soil Survey	089962000	Wickert-Berles-Rough complex (SSm)	Mixed	Mose Slope	34%	retard/acid	24"	YALOW SILTSTONE	OAK Hickory										
											USDA										
Oa	2	15YR 2.5/1																			
Bw	16	10YR 4/6																			
C	24	10YR 4/6																			
ZR	32a																				

Other Notes:

VEG: CHESTNUT OAK, RED OAK, HICKORY, WHITE PINE, HUCKLEBERRY

OPRZ/1 Mn
 concentrations
 on Rocks

Calluvium over residuum
 2750
 24+

6' S Strike: 90

TEST PIT DESCRIPTION

Soil Scientist: M WOOD
 Field Assistant: M DUGAN

Signature: 

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
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 Fax: 717-394-1063

Test Pit ID: P124-16015-134C MGW Topographic Position: NOSE SLOPE Parent material: COLLYER MESSIDUUM
 Date: 6/15/16 % Slope: 33 Slope Aspect: 277
 Job Name: Dominion - Atlantic Coast Pipeline Soil Survey Drainage Class: TWP Depth to Water Table:
 RETTEW Job #: 089962000 Depth to Refusal: 25 Slope Failure or slip:
 NRCS Soil Unit: WEILSMT - BEAKS - ROUGH Bedrock Type: GRAY-YELLOW SLT STONE Dip Slope & Direction: 9° S Strike: 187°
 Mineralogy: MIXED Vegetation: Chestnut oak, Blueberry (from photo)

Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Rooting/Stubble	Structure Type, Grade, and Size	Moist Consistence	Major Boundary Topography & Orientation	Redox Feature Color	Redox Feature Description	Roots	Roots Testimonial/pt	Lab Sample ID	Notes	
0-1	0e	7-5YR 3/2	-	-	-	-	-	-	-	-	-	-	-	3F/VF	4.5			
1-1.5	A	10YR 5/1	5.1 ^{YR}	8	24	GR 40	< 1.0"	P ₀	VF GR	VHR	AII	-	-	3F/VF	0.25			
								S ₈								4.7		
1.5-7	Bw ₁	10YR 6/4	5.1 ^{YR}	10	26	GR 65	< 3.0"	P ₁	VF SBK	VHR	CW	-	-	3F/VF	0.75			
								S ₁₀								4.9		
7-16	Bw ₂	10YR 6/4	5.1 ^{YR}	10	26	GR 80%	< 5.0"	P ₀	VF SBK	FR	CW	-	-	2F/VF	1.25			
								S ₅₀								4.7		
16-25	C _r	10YR 6/4	-			GR 79%												
25+	R																	

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: M Wood
 Field Assistant: M Bucan

Signature: _____



RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	<u>P 125 160615-1340-MGW</u>	Topographic Position:	<u>NOB SLOPE</u>	Parent material:	<u>FESTUCUA7</u>
Date:	<u>6/15/16</u>	% Slope:	<u>25</u>	Slope Aspect:	<u>261</u>
Job Name:	<u>Dominion - Atlantic Coast Pipeline Soil Survey</u>	Drainage Class:	<u>VD</u>	Depth to Water Table:	<u>724</u>
RETTEW Job #:	<u>089962000</u>	Depth to Refusal:	<u>24</u>	Slope Failure or slip:	
NCS Soil Unit:	<u>WICKERT-BECKS-ROUCH</u>	Bedrock Type:	<u>SILTSTONE</u>	Dip Slope & Direction:	<u>8% 90°</u>
Mineralogy:	<u>MIXED</u>	Vegetation:	<u>See below.</u>	Strike:	<u>0°</u>

Horizon	Depth In Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (Inches)	Rooting/Stubness	Structure Type, Grade, and Size	Molt Consistence	Moist Boundary Resistance	Redox Feature Color	Region Feature Description	Roots	Root Penetration/In	Lab Sample ID	Notes
Dc	0-1	7.5YR 3/2	-	-	-	-	-				AS			3 F/VF	5.2		
Bw1	1-3	10YR 5/6	S1R	11	20	GL 15%	<0.5	P6 S0	1VF SBK-CL	VHL	CW	-	-	3 F/VF 2 M/CO	0.25 4.8		
Bw2	3-11	10YR 5/6	S11	14	20	CM 25%	<1.5	P0 S0	1VF SBK	FR	CW	-	-	2 F/VF 1 M/CO	1.25 4.6		
BC	11-17	10YR 5/6	S11	14	20	CM 65%	<2.5	P0 S0	1VF SBK	FR	CW	-	-	1 F/VF 1 M/CO	1.25 4.5		
Cr	17-24	10YR 5/6				95%	<2.5	-						1 M/CO			
R	24+																

Other Notes:

VIS. CHESTNUT OAK, RED OAK HYBRID OAK

TEST PIT DESCRIPTION

Soil Scientist: M. Wood
 Field Assistant: M. DUGAN

Signature: M. Wood

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1053

Test Pit ID:	<u>P-26-16 0615-1410-MBW</u>	Topographic Position:	<u>MID BACK SLOPE</u>	Parent material:	<u>COLUMBIUM/RESIDUUM</u>
Date:	<u>6/15/16</u>	% Slope:	<u>51</u>	Slope Aspect:	<u>322</u>
Job Name:	<u>Demolition - Atlantic Coast Pipeline Soil Survey</u>	Drainage Class:	<u>SED</u>	Depth to Water Table:	
RETTEW Job #:	<u>089962000</u>	Depth to Refusal:	<u>29</u>	Slope Failure or slip:	
NRCS Soil Unit:	<u>WEIKENT-BFCK</u>	Bedrock Type:	<u>SHL Stone</u>	Dip Slope & Direction:	<u>13N</u>
Mineralogy:	<u>MIXED</u>	Vegetation:	<u>See below</u>	Strike:	<u>172</u>

Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (Inches)	Moisture/Structure	Structure Type, Grade, and Size	Moist Consistence	Moist Bulk Density	Redox Feature Color	Moisture Description	Roots	Rock Fragmentation/ pH	Lab Sample ID	Notes	
0e	0-1	7.5YR 3/2	-	-	-	-	-	-	-	-	-	-	-	3F/UF	4.5	S1		
A3	1-2	7.5YR 4/2	SIL	12	17	-	-	PO	VF gr	VFr	AI	-	-	3F/UF	1.5 4.5	S2		
BW1	2-6	10YR 5/4	SIL	12	17	Gr 15%	<0.5"	PO SO	VP SBK/gr	VFr	CW	-	-	3F/UF 1C0/M	1.0 4.6	S3		
BW2	6-11	10YR 5/6	SIL	14	12	Gr 25%	<1"	PO SO	2F SBK	Fr	CW	-	-	2F/UF 2C0/M	1.25 4.8	S4		
BW3	11-21	10YR 5/6	SIL	16	25	Gr 35%	<2"	PO SO	2M SBK	Fi	CW	-	-	1F/UF 1C0/M	2.75 4.6	S5		
CR	21-29	10YR 5/6	Xgr SIL	16	25	Gr 70%	<5"	PO SO	OPM	-	CW	-	-	1F/UF 1C0/M	4.6	-		
R	29+																	

Other Notes: Veg - CHESTNUT OAK, HUCKLEBERRY, RED OAK

TEST PIT DESCRIPTION

Soil Scientist: M. W. DOD
 Field Assistant: M. DUGAN

Signature: _____

M. W. DOD

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1053

Test Pit ID:	<u>P-127-160615-1110-MGW</u>	Topographic Position:	<u>VFR BACK SLOPE</u>	Parent material:	<u>COUVIUM</u>
Date:	<u>6/15/16</u>	% Slope:	<u>37</u>	Slope Aspect:	<u>306</u>
Job Name:	<u>Dominion - Atlantic Coast Pipeline Soil Survey</u>	Drainage Class:	<u>WV</u>	Depth to Water Table:	<u>> 30</u>
RETTEW Job #:	<u>089962000</u>	Depth to Refusal:	<u>38"</u>	Slope Failure or slips:	
NRCS Soil Unit:	<u>WEIKCAT-BFKS</u>	Bedrock Type:	<u>314-STOUB</u>	Dip Slope & Direction:	
Mineralogy:	<u>MIXED</u>	Vegetation:	<u>See below</u>		

Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture/Structure	Structure Type, Grade, and Size	Moist Consistence	Region Boundary Topography & Disturbance	Redox Feature Color	Redox Feature Description	Roots	Rock Fragmentation/ pH	Lab Sample ID	Notes
A ₁	1.5-2.5	7.5YR 3/1	SIL	12	20	-	-	PO SO	1VFgr	VFR	CW	-	-	3FAC	0.25		
B ₁	2.5-5	10YR 5/6	SIL	9	22	9% 5% 9%	< 0.5"	PO SO	1VF sbx	VFR	CW	-	-	3FNT 1Mco 1VC	0.75		
B ₂	5-10	10YR 5/6	SIL	13	22	9% 3%	2.1"	PO SO	2VF sbx	F _r	CW	-	-	2FVF 2Mco	0.75		
B ₃	10-29	7.5YR 5/6	SIL ^{xcn}	18	22	9% 6% 5%	4.5"	PO SS	2VF sbx	F _r	CW	-	-	1FVF 2Mco	1.00		
C _r	29-38	7.5YR 5/6				9% 90%									4.6		
R	38+																

Other Notes:

Chestnut oak, red oak, blueberry

TEST PIT DESCRIPTION

Soil Scientist: M. Wood
 Field Assistant: M. DUGAN

Signature: _____

M. Wood

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID: P-228-160615-1050 - M6W1
 Date: 4/15/16
 Job Name: Dominion - Atlantic Coast Pipeline Soil Survey
 RETTEW Job #: 069962000
 NRCS Soil Unit: WEIKERT- BROWN
 Mineralogy: MIXED
 Topographic Position: UPPER SHOULDER
 % Slope: 17
 Drainage Class: SED
 Depth to Refusal: 18
 Bedrock Type: SILTSTONE
 Vegetation: See below
 Parent material: RESIDUUM
 Slope Aspect: 247
 Depth to Water Table: 218
 Slope Failure or slip: _____
 Dip Slope & Direction: _____
 USDA

Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Rooting/ nodules	Structure Type, Grade, and Size	Molt/ Consistence	Moisture Boundary Resistance	Redox Feature Color	Redox Feature Description	Roots	Product Temperature/ pH	Lab Sample ID	Notes								
De	0-1	7.5YR 3/2	-	-	-	-	-	-	-	-	AS	-	-	SF/VF	4.6										
A	1-2	10YR 4/2	SIL	12	20	Gr 10%	2.05"	PO	NF gr	VFR	CW	-	-	3F/VF	0.25										
M1	2-11	10YR 5/4	VSr SIL	12	20	Gr 40%	21.5"	PO	VF SBM/gr	FR	CW	-	-	2F/VF 2M/C0	2.25										
M2	11-18	10YR 5/4	VSr SIL	15	20	Gr 55	<5"	PO	VF SBK	FR	CW	-	-	2F/VF 2M/C0	1.75										
R																									

Other Notes: VEG. RED OAK, HAWK LORUST, HUCKLEBERRY, WHITE PINE

TEST PIT DESCRIPTION

Soil Scientist: Russell Cosco
 Field Assistant: Rachel Hill

Signature: 

[Sampled]

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	Date:	Job Name:	MRCS Soil Unit:	Mineralogy:	Topographic Position:	Parent material:	Notes						
D129-16-015-1045-RLL	10/15/16	Dominion - Atlantic Coast Pipeline Soil Survey	089962000	Mixed	None above saddle	Colluvium over residuum							
					% Slope: 30%	Slope Aspect: 180°							
					Drainage Class: A D-U/D	Depth to Water Table: 20+''							
					Depth to Refusal: 20''	Slope Failure or slip: —							
					Bedrock Type: Fire Sandstone	Dip Slope & Direction: N45°E 15°							
					Vegetation: Red Maple Sugar Maple								
					USDA								
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (Inches)	Moisture/Structure	Structure Type, Grade, and Size	Moist Consistence	Soil Boundary Description	Redox Feature Color	Notes
D _a	3	5YR 2.5/1	—	—	—	—	—	—	FR	FR	CS	—	ZF
A	5	7.5YR 4/1	L	8	90	5% ST	1/2"	FR	FR	FR	CS	—	ZF, M
B _w	12	7.5YR 5/10	L	8	45	25% CN	1/2 x 1/4"	FR	FR	FR	CS	—	IF
C _r	18	10YR 5/10	SL	15	10	75% CN	1 x 5"	FR	FR	FR	CS	—	
R	20												

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Russell Losco
 Field Assistant: Rachel Hill

Signature: Russell Losco

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1053

Test Pit ID: P130160615-1050-RLL
 Date: 6/15/2016
 Job Name: Dominion - Atlantic Coast Pipeline Soil Survey
 RETTEW Job #: 089962000
 NCRS Soil Unit: Wet-Set-Berks 35-55
 Mineralogy:

Topographic Position: Backslope
 % Slope: 45%
 Drainage Class: WD
 Depth to Refusal: 24"
 Bedrock Type: Fire Sandstone
 Vegetation: Maple, Ph. Linn, Evergreen

Parent material: Colluvium over residuum
 Slope Aspect: 265°
 Depth to Water Table: 24"
 Slope Failure or slip:
 Dip Slope & Direction: S65°E 90°

Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture	Structure Type, Grade, and Size	Moist Consistence	Native Boundary Topography & Distances	Redox Feature Color	Redox Feature Description	Roots	Moisture Content (%)	Lab Sample ID	Notes
Da	15	10YR2.5/1	—	—	—	—	—	—	FR	FR	CLS	—	—	2VF, F	0		
Bu1	8	10YR4/4	SIL	17	10	ST 5%	1/4"	SS	FISBR	FR	GLS	—	—	3F, 2M	2.0		
Bu2	14	10YR5/8	SIL	20	5	ST 20%	1/2"	SS	FISBR	FR	GS	—	—	1M	4.5		
PC	24	10YR6/10	S.L	20	4	CN 50%	1" x 4"	MS	FISBR	FR		—	—		4.0		
R	24+														4.9		

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Russell Losco
 Field Assistant: Rachel Hill

Signature: _____



RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	<u>P181160615-1100-RLC</u>	Topographic Position:	<u>Shoulder</u>	Parent material:	<u>Colluvium over residuum</u>
Date:	<u>6/15/16</u>	% Slope:	<u>45%</u>	Slope Aspect:	<u>S00</u>
Job Name:	<u>Dominion - Atlantic Coast Pipeline Soil Survey</u>	Drainage Class:	<u>Interfluvial</u>	Depth to Water Table:	<u>24" +</u>
RETTEW Job #:	<u>089962000</u>	Depth to Refusal:	<u>24"</u>	Slope Failure or slip:	—
NRCS Soil Unit:	<u>Uc Vert Bould</u>	Bedrock Type:	<u>Fine Sandstone</u>	Dip Slope & Direction:	—
Mineralogy:	<u>Mixed Bould</u>	Vegetation:	—	Strike:	—

USDA																	
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Fracture/Inclusions	Structure Type, Grade, and Size	Moist Consistence	Notation Boundary Topography & Substrata	Redox Feature Color	Redox Feature Description	Roots	Rock Fragmentation/Incl. mm	Lab Sample ID	Notes
0a	2	5YR 2.5/1	—	—	—	—	—	—	FR	FR	cls	—	—	1F	0	5.3	
A	5	10YR 2.5/1	Sil	5	20	ST 100%	1/2"	PO	FISB2	FR	cls	—	—	3F, 2M	1.5	4.2	
B _{us}	11	10YR 4/1	Sil	15	15	ST 20%	1/2"	SP	FISB2	FR	cls	—	—	—	2.0	5.1	
C _r	24	10YR 7/4	Sil	16	10	CN 40%	1/2 + 4"	SP	FISB2	FR	cls	—	—	—	4.5	4.9	
R	24+							SS									

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Russell Losco
 Field Assistant: Rachel Hill

Signature: _____



Sampled

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P13211001615-1110-REL					Topographic Position:	Rock Slope										
Date:	4/15/16					% Slope:	25%										
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey					Drainage Class:	WD										
RETTEW Job #:	089962000					Depth to Refusal:	38"										
NRCS Soil Unit:	Udult BeckS					Bedrock Type:	Fire Sandstone										
Mineralogy:	Mixed					Vegetation:	Red Maple										
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (Inches)	Minerals/ Substrata	Structure Type, Grade, and Site	Moist Consistence	Medium Bulk Density (g/cm ³)	Redox Feature Color	Redox Feature Description	Roots	Moist Permeability/ pH	Lab Sample ID	Notes
0a	1.5	5YR2.5/1	—	—	—	—	—	—	FR	FR	cls	—	—	FR, IM	0	1	
A	4	7.5YR2.5/2	SIL	10	20	ST 10%	1/2"	PO SO	FR2CR	FR	cls	—	—	WF, IM	1.25 9.9	2	
Bw	14	10YR5/10	SH	13	30	ST 10%	1/2"	SP SS	FR5BR	FR	gw	—	—	FR	9.5 5.2	3	
Bt	38	7.5YR5/10 5YR7/10	SIL	20	5	CN 25%	1" x 3"	SP MS	MISBR	FR		—	—		4.0 4.4	4	Distinct clay films Cgd Lithochromic 2.5YR 5/10

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Russell Lawson
 Field Assistant: Rachel Hill

Signature: _____

[Handwritten Signature]

Sampled

NETTEV Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID: P133160615-115-R11 Topographic Position: back slope
 Date: 6/15/2016 % Slope: 20%
 Job Name: Dominion - Atlantic Coast Pipeline Soil Survey Drainage Class: SED
 RETTEV Job #: 089962000 Depth to Refusal: 14"
 NRCS Soil Unit: Reck's (22) Kert Bedrock Type: Fine Sandstone
 Mineralogy: Mixed Vegetation: Maple

Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Position/ Substratum	Structure Type, Grade, and Size	Moist Consistence	Medium-Bounding Fragments & Disturbance	Redox Feature Color	Redox Feature Description	Roots	Moisture Equivalent/ in	Lab Sample ID	Notes
<u>Da</u>	<u>1</u>	<u>5gr²⁵/1</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>2F, 1M</u>	<u>0</u>	<u>1</u>	
<u>A</u>	<u>4</u>	<u>10gr^{3/2} SIL</u>	<u>20</u>	<u>4</u>	<u>10% b</u>	<u>10% b ST</u>	<u>1/2"</u>	<u>SP</u>	<u>M2GR</u>	<u>RR</u>	<u>cb</u>	<u>—</u>	<u>—</u>	<u>ZF</u>	<u>5.1</u>	<u>2</u>	
<u>Bw</u>	<u>10</u>	<u>10gr^{5/16} SIL</u>	<u>22</u>	<u>5</u>	<u>15% b</u>	<u>15% b ST</u>	<u>1/2"</u>	<u>MP</u>	<u>F15GR</u>	<u>RR</u>	<u>gb</u>	<u>—</u>	<u>—</u>	<u>1VF</u>	<u>5.2</u>	<u>3</u>	
<u>Cr</u>	<u>12</u>	<u>10gr^{6/16} SIL</u>	<u>26</u>	<u>5</u>	<u>CN</u>	<u>CN 10%</u>	<u>1" x 4"</u>	<u>MP</u>	<u>F25GR</u>	<u>RR</u>	<u>—</u>	<u>—</u>	<u>—</u>		<u>4.5</u>		
<u>R</u>	<u>14</u>							<u>MS</u>							<u>4.4</u>		

Other Notes: _____

TEST PIT DESCRIPTION

Soil Scientist: Steve Radio
 Field Assistant: Stephanie Moraca

Signature:

Steve Radio

RETTW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	Date:	Job Name:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	Parent material:	Lab Sample ID	Notes						
P134-160615-1506-5JD	06/15/16	Dornton - Atlantic Coast Pipeline Soil Survey	Welkett-Berks	Mixed	concave bowl, foot slope	colluvium	84 / 122							
					% Slope: 15 / 12	Slope Aspect: MWD	34							
					Drainage Class: N/A	Depth to Water Table: N/A								
					Depth to Refusal: N/A	Slope Failure or slip: N/A								
					Bedrock Type: N/A	Dip Slope & Direction: N/A								
					Vegetation: red maple, sugar maple, hickory									
					USDA									
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture/Structure	Structure Type, Grade, and Size	Moist Consistency	Redox Feature Color	Roots	Lab Sample ID	Notes
De	2	5YR 2.5/1	-	-	-	gr 15	.5-2	-	-	aw	-	M=	SI	
A	4	7.5YR 3/3	S11	16	18	gr 20	1-2	PS	1fgf	fr	-	CF	S2	
B+1	22	7.5YR 5/6	S11	24	16	gr 20	.5-1	PS	2msbk	fr	-	CH	S3	
B+2	34	7.5YR 6/6	S11	36	16	gr 25	.5-1	PS	2msbk	fr	10YR 3/1 Mn	CH	S4	
B+3	50	10YR 5/6	S11	30	18	gr 40	.5-1	PS	2msbk	fr	10YR 4/1 10YR 5/5 10YR 6/5	CH	S5	

Other Notes:

NOT → skeletal top 50 cm of argill. c < 35% rf

TEST PIT DESCRIPTION

Soil Scientist: Steve Dadio
 Field Assistant: Stephanie Haraca

Signature: [Signature]

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	Date:	Job Name:	RETTEW Job #:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	% Slope:	Drainage Class:	Depth to Refusal:	Bedrock Type:	Vegetation:	Parent material:	Slope Aspect:	Depth to Water Table:	Slope Failure or slip:	Dip Slope & Direction:	Roots	Rock Fragmentation/Type & %	Rock Fragment Size (inches)	Structure Type, Grade, and Size	Moist. Consistence	Redox Feature Color	Water Feature Description	Lab Sample ID	Notes
						backslope	21	WD	N/A	Sandstone	chestnut oak, mountain laurel, virginia pine, blueberry														
Oe	2	5YR 2.5/1	-	-	ch	20	1-4	-	ow	-							CF	ch	.25					S1	
Oa	4	10YR 2/1	-	-	ch	20	1-4	-	ow	-							CF	ch	1.25					S2	
B+1	20	10YR 6/4	s ⁺ 1	18	18	ch	40	2-4	ow	-							FF	FM	2.25					S3	
B+2	30	10YR 6/6	S.1	18	20	ch	55	2-4	ow	-							FF	FC	5.25					S4	
ZRc	50	7.5YR 4/6	1	20	40	ch	75	.5-1	-	-							VF	F	2.5					S5	

Other Notes:

○ horizons are compacted and dense white mycelia present

TEST PIT DESCRIPTION

Soil Scientist: Steve Dadio
 Field Assistant: Stephanie Morace

Signature: _____

B. Dadio

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	Date:	Job Name:	RETTEW Job #:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	% Slope:	Drainage Class:	Depth to Refusal:	Bedrock Type:	Vegetation:	Parent material:	Slope Aspect:	Depth to Water Table:	Slope Failure or slip:	Dip Slope & Direction:	Redox Feature Color:	Redox Feature Description:	Roots:	Root Measurement/pt	Lab Sample ID	Notes	
P137-160615-1152-sdd	06/15/16	Dominion - Atlantic Coast Pipeline Soil Survey	089962000			backslope	27	WD	32		chestnut oak, low bush blueberry, hickory	coll/fres		N/A	N/A	20 S							
Oe	↑	5YR 2.5/1	-	-	ch	1-4	-	-	-	aw		CF CH	0.25 4.75	-	-								
Bw	14	5YR 5/3	sil	22	10	1-4	ps	1 m sbk	fr	cw		EN CC	2.25 5.25	-	-								
2c	24	5YR 5/3	sil	20	12	1-4	ps ss	0 m	fr	aw		FN FC	1.25 5.25	-	-								
2Cr	32	-	-	-	-	-	-	-	-	aw		-	-	-	-								
2R	32'	-	-	-	-	-	-	-	-	-		-	-	-	-								

Other Notes:

TEST PIT DESCRIPTION
 Soil Scientist: P. Fenstermaker
 Field Assistant: Rachel Hill

Signature: Paul Shuck

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Structure Type, Grade, and Size	Molt Consistence	Moist Bulk Density (g/cm ³)	Redox Feature Color	Parent Material	Roots	Moist Permeability (in)	Lab Sample ID	Notes
8-138-1000/16-1219-DET	0-1.5 SUR	35/11	-	-	-	-	-	-	-	-	-	-	3f	5.3	-	Feu Sulfate stains
DATE: 4/16/16	1.5-3.5	10YR 3/2	9/12	16	15	30% CN	< 4"	1 m yr SP SO	VFR	CU	-	2f, M	0.25 4.6	-	-	
JOB NAME: Dominion - Atlantic Coast Pipeline Soil Survey	3.5-11	10YR 5/3	5/2	17	13	38% CN	1/2-5"	1f, Bk SP SO	FR	CU	-	2f, M, Co, M	1.0 4.5	-	-	
RETTEW Job #: 08996200	11-23	10YR 5/4	5/2	18	12	20% Stry	1/2-2 1/4"	1 m, Bk SP SO	FR	AS	-	2f	1.75 4.5	-	-	
NRCS Soil Unit: Wickert-Belts complex (53F)	23-28	10YR 5/3	5/1	18	10	95% CN	< 3"	1 c, 5Bk SP SO	FR	AW	-	1f	-	-	-	Shale Fe-Banded with BR-Suff
Mineralogy: Mixed	28-88	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: P. Fenslermacher
 Field Assistant: Rachel Hill

Signature: Daniel Fenslermacher

RETTEV Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P-139A-100010-1341-DEP			Topographic Position:	Upper Back Trench			Parent material:	Colluvium Residuum							
Date:	4/11/16			% Slope:	49			Slope Aspect:	231°							
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey			Drainage Class:	W1			Depth to Water Table:	-							
RETTEV Job #:	089962000			Depth to Refusal:	83			Slope Failure or slip:	-							
NRCS Soil Unit:	W1X1t-Banks complex			Bedrock Type:	Shale 1-5" thick			Dip Slope & Direction:	40° SSE							
Mineralogy:	W1X1t-Banks complex			Vegetation:	Shrub oak, black locust, Red oak, white pine, blueberry			USDA								
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (Inches)	Structure Type, Grade, and Size	Moist Consistence	Nation Standard Topography & Distances	Redox Feature Color	Soil Texture Description	Roots	Water Penetration/Inches	Lab Sample ID	Notes
0e	0-2	5YR 3/2	-	-	-	-	-	-	-	-	-	-	3f 1m	-	-	-
A	0-5	10YR 3/2	S.L	16	12	10%	1/4"	PO 20GR	VFR	AW	-	-	af, m	0.1'	-	-
	5-10	10YR 4/4	S.L	17	10	15%	1/4"	PO 50	FR	CW	-	-	af, m 1c0	0.75	-	-
Bu2	5-16.5	7.5YR 5/4	S.L	18	10	15%	<1/4"	PO 50	FR	CW	-	-	RM 1f	1.25 4.5	-	-
Bu2	16.5-23	7.5YR 5/4	S.L	18	10	55%	1/2-4"	PO 50	FR	AW	-	-	1f	0.25 4.7	-	-
2R	23+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Component Rocks

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: D. Fenger-Hermoniker
 Field Assistant: Rene Hill

Signature: Daniel Fenger

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 Fax: 717-394-1053

Test Pit ID:	P-140-106010-1231-DEF		Topographic Position:		Upper Buckskins		Parent material:												
Date:	10/14/10		% Slope:		49%		Slope Aspect:												
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey		Drainage Class:		Well		Depth to Water Table:												
RETTEW Job #:	089962000		Depth to Refusal:		21"		Slope Failure or slip:												
NRCS Soil Unit:	Wetland - Baki - Com. Next (S3F)		Bedrock Type:		Very fine grained sandstone		Dip Slope & Direction:												
Mineralogy:	Mixed -		Vegetation:		Castorocky white pine		Black gum												
USDA																			
Horizon	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (Inches)	Moisture/soil	Structure Type, Grade, and Size	Molt Consistence	Moisture Boundary Disturbance	Redox Feature Color	Moisture Feature Description	Roots	Moisture Feature Description	Roots	Moisture Feature Description	Lab Sample ID	Notes
A	0-2	10YR 3/2	Sil	17	12	40% CW	2-2"	Pg Sc	IFGR	Vfr	AW	-	-	26, 1M	0.1	4.5	S1		
Bw1	2-14	10YR 5/4	S.L	18	12	40% CW	2-4"	Pg So	IFSM	Fr	Kw	-	3f am/co	0.75	5.2	S2			
Bw2	14-21	10YR 5/4	Sil	18	12	45% CW	<4"	Pg So	IFSM	Fr	AW	-	-	0.75	4.4	S3			
Bw2	21+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: P. Kinstler/Machul
 Field Assistant: Rachael Hill

Signature: David Smith

RETTEW Associates, Inc.
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 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P-19-100610-1235-DET		Topographic Position:		Shoulder		Parent material:	Colluvium over residual					
Date:	6/10/10		% Slope:	2%		Drainage Class:	well		Slope Aspect:	-			
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey		Depth to Refusal:	23"		Bedrock Type:	Very fine grained sandstone		Slope Failure or slip:	-			
RETTEW Job #:	089962000		Vegetation:	Write pin, hickory, chestnut oak, blueberry, sugar maple		Dip Slope & Direction:	40 NE		Strike:	318°			
MNRCS Soil Unit:	Bw1, Vert-Podsols complex (53F)		USDA			Roots	3F		Lab Sample ID				
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Structure Type, Grade, and Size	Moist Consistence	Reaction Boundary Temperature & Distance	Redox Feature Color	Redox Feature Description	Notes
De	0-0.3	5YR 2.5/1	-	-	-	-	< 4"	HR	VF, AW	-	-	3F	Subsurface of top edge oriented randomly
A	0.3-3.5	10YR 3/3	S.L	20	18	40% CN	4.5"	HR	VF, AW	-	-	3F	
Bw1	3.5-12	10YR 5/4	S.L	21	15	40% CN	< 5"	HR	VF, AW	-	-	3F	
2Bw2	12-23	10YR 5/4	S.L	20	14	50% CN	1/2-8"	HR	VF, AW	-	-	3F	
2R	23+	-	-	-	-	-	-	HR	VF, AW	-	-	3F	

Other Notes:

Abba - Residuum

TEST PIT DESCRIPTION

Soil Scientist: D. Fenstermacher
 Field Assistant: Rachel Hill

Signature: _____

Daniel Fenstermacher

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
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 Fax: 717-394-1053

Test Pit ID:	P-143-166016-1735-DEF					Topographic Position:	Summit / Shoulder											
Date:	9/16/16					% Slope:	18% (8' down)											
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey					Drainage Class:	Semi-wet excess											
RETTEW Job #:	089962000					Depth to Refusal:	10'											
MRCSS Soil Unit:	Weilert-Balks Complex (53F)					Bedrock Type:	Fine grained sandstone - 2' from surface											
Mineralogy:	Mixed					Vegetation:	Chestnut oak Hickory White Pine											
USDA																		
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (Inches)	Rooting/Structure	Structure Type, Grade, and Size	Moisture Consistence	Surface Boundary Temperature & Direction	Redox Feature Color	Moist Feature Description	Roots	Root Penetration/Depth	Lab Sample ID	Notes	
Oe	0-2	5YR	-	-	-	-	-	-	-	-	-	-	-	3R	-	-	-	
A	2-5	7.5YR 3/1	S.L	14	25	40% CN	4.5"	Pc	26GR	VFR	AW	-	-	3F 2m	0.25	S2		
																		5B
Bw	2.5-5.5	7.5YR 5R	S.L	16	20	45% CN	4.6"	SP	15BR	FR	AW	-	-	2F	1.25	S3		
																		5B
R	5.5ft	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: David M. Hall
 Field Assistant:

Signature: [Signature]

RETTEW Associates, Inc.
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 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	Date:		Job Name:	RETTEW Job #:	NCS Soil Unit:	Mineralogy:	Topographic Position:	Parent material:	Notes								
P-144-160616-1200-SSW	6/16/16		Dominion - Atlantic Coast Pipeline Soil Survey	089962000	WEIKERT - BRKS	MIXED	% Slope: 63% Drainage Class: M E L L Depth to Refusal: 28" Bedrock Type: SILTSTONE	Column over Residuum									
							Dip Slope & Direction: 1.50 NE Strike: 128°										
							USDA										
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture/ Saturation	Structure Type, Grade, and Size	Mold Consistence	Horizon Boundary Topography & Distances	Redox Feature Color	Redox Feature Description	Roots	Mold Resistance/ per cent	Lab Sample ID	Notes
0e	0-2	5YR2.5/1	-	-	-	-	< 1	-	1.5 PR	VER	awn	-	-	3-VE 2-V	5.7	-	
A	2-3	10YR2.5/1	CH SIL	12	18	15 CH	< 1	-	1.5 PR	VER	awn	-	-	3-F, M 2-VE, C	0.25	-	SANDSTONE COE
Bm1	3-9	10YR2.5/0	SIL	16	12	30 CH	1-3	PO SS	2M SBK	VR	cm	-	-	3-F 2-M, C 1-VE	0.75	-	SANDSTONE COE
Bm2	9-28	10YR5/0	VEH SIL	17	15	55 CH	2-6	PO SS	1M SBK	VR	cm	-	-	2-M, C 1-VE	5.9	-	
2C1	27-28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
2R	28*	SILTSTONE	SILTSTONE				BEDROCK										

Other Notes: BED SANDSTONE FLAG > 6" at SURFACE, STEEP LINER - LINEAR BACSIOR

TEST PIT DESCRIPTION

Soil Scientist: JOHN M. MATH
 Field Assistant: _____

Signature: [Signature]

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
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 Fax: 717-394-1053

Test Pit ID: P-145-160616-1145-35W Topographic Position: BACKSLOPE (NORSE) Parent material: RESIDUUM
 Date: 6/16/16 % Slope: 34% Slope Aspect: 137°
 Job Name: Dominion - Atlantic Coast Pipeline Soil Survey Drainage Class: SOFT WEAT EXCESSIVE Depth to Water Table: -
 RETTEW Job #: 089962000 Depth to Refusal: 36 Slope Failure or slip: -
 NRCS Soil Unit: WIKERT-BEKA Bedrock Type: SILTSTONE Dip Slope & Direction: 14° NW Strike: 350°
 Mineralogy: MIXED Vegetation: WHITE PINE MAPLE, STERRING MAPLE, HICKORY

Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (Inches)	Moisture/Structure	Structure Type, Grade, and Size	Moist Consistence	Nutrient Boundary Temperature & Distribution	Redox Feature Color	Redox Feature Description	Roots	Depth to Rooting/Feet	Lab Sample ID	Notes
<u>0e</u>	<u>0-1</u>	<u>SPL. SLT</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>< 1</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>as</u>	<u>-</u>	<u>-</u>	<u>3-1E 2-E 1-C</u>	<u>4.5</u>	<u>-</u>	
<u>Δ</u>	<u>1-2</u>	<u>10YR 3/1</u>	<u>CH SIL</u>	<u>12</u>	<u>15</u>	<u>25 CH</u>	<u>< 1</u>	<u>So</u>	<u>1FQR</u>	<u>VER aw</u>	<u>aw</u>	<u>-</u>	<u>-</u>	<u>3-1E 2-E 2-E</u>	<u>0.5</u>	<u>-</u>	
<u>Bw</u>	<u>2-9</u>	<u>10YR 5/6</u>	<u>VCU SIL</u>	<u>13</u>	<u>15</u>	<u>40 CH</u>	<u>1-2</u>	<u>So</u>	<u>1FSDK</u>	<u>VER cm</u>	<u>cm</u>	<u>-</u>	<u>-</u>	<u>1-E, M, C</u>	<u>1.0</u>	<u>-</u>	<u>SANDSTONE & SILTSTONE COE IN UPPER</u>
<u>Bu</u>	<u>9-19</u>	<u>10YR 5/6</u>	<u>VCU SIL</u>	<u>11</u>	<u>14</u>	<u>75 CH</u>	<u>1-4</u>	<u>So</u>	<u>1FBRK</u>	<u>VER cm</u>	<u>cm</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	
<u>Cr</u>	<u>19-39</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	
<u>R</u>	<u>36+</u>	<u>SILT</u>	<u>STONE</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>BED ROCK</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	

Other Notes: SOME COLUMNAR DEFRENDE AT SURFACE