

Appendix A: Baseline Pipeline Impact Radius Tables for MAP 9.6.S.1

1. High-Pressure Pipelines Transferring Flammable and Combustible Liquids

Table 1: Diesel Thermal Radiation ASDs (feet)

Diameter (in)	ASD (feet)
4	536
6	634
8	713
10	782
12	843
14	898
16	949
18	996
20	1,040
22	1,081
24	1,121

Table 2: Gasoline Thermal Radiation ASDs (feet)

Diameter (in)	ASD (feet)
4	508
6	600
8	676
10	741
12	798
14	851
16	899
18	943
20	985
22	1,024
24	1,061

Table 3: Crude Oil Thermal Radiation ASDs (feet)

Diameter (in)	ASD (feet)
4	521
6	616
8	693
10	759
12	819
14	872
16	921
18	967
20	1,010
22	1,050
24	1,089
26	1,125
28	1,160
30	1,193
32	1,225
34	1,256
36	1,286
38	1,315
40	1,343
42	1,369
44	1,397
46	1,423
48	1,448

2. High-Pressure Pipelines Transferring Flammable and Combustible Gasses (Thermal Radiation)

Table 1: Natural Gas Pipeline Thermal Radiation ASDs (feet)

Diameter (in)	Pipeline Pressure (psi)															
	60	120	240	360	480	600	720	840	960	1,080	1,200	1,320	1,440	1,560	1,680	1,800
4	71	100	142	173	200	224	245	265	283	300	317	332	347	361	375	388
6	106	150	212	260	300	336	368	397	425	450	475	498	520	541	562	581
8	142	200	283	347	400	448	490	530	566	601	633	664	693	722	749	775
10	177	250	354	433	500	560	613	662	708	751	791	830	867	902	936	969
12	212	300	425	520	601	671	736	794	849	901	950	996	1,040	1,083	1,124	1,163
14	248	350	495	607	701	783	858	927	991	1,051	1,108	1,162	1,214	1,263	1,311	1,357
16	283	400	566	693	801	895	981	1,059	1,132	1,201	1,266	1,328	1,387	1,444	1,498	1,551
18	318	450	637	780	901	1,007	1,103	1,192	1,274	1,351	1,424	1,494	1,560	1,624	1,685	1,744
20	354	500	708	867	1,001	1,119	1,226	1,324	1,415	1,501	1,583	1,660	1,734	1,804	1,873	1,938
22	389	550	779	953	1,101	1,231	1,348	1,456	1,557	1,651	1,741	1,826	1,907	1,985	2,060	2,132
24	425	601	849	1,040	1,201	1,343	1,471	1,589	1,699	1,802	1,899	1,992	2,080	2,165	2,247	2,326
26	460	651	920	1,127	1,301	1,455	1,594	1,721	1,840	1,952	2,057	2,158	2,254	2,346	2,434	2,520
28	495	701	991	1,214	1,401	1,567	1,716	1,854	1,982	2,102	2,216	2,324	2,427	2,526	2,622	2,714
30	531	751	1,062	1,300	1,501	1,679	1,839	1,986	2,123	2,252	2,374	2,490	2,600	2,707	2,809	2,907
32	566	801	1,132	1,387	1,601	1,790	1,961	2,119	2,265	2,402	2,532	2,656	2,774	2,887	2,996	3,101
34	602	851	1,203	1,474	1,702	1,902	2,084	2,251	2,406	2,552	2,690	2,822	2,947	3,067	3,183	3,295
36	637	901	1,274	1,560	1,802	2,014	2,207	2,383	2,548	2,702	2,849	2,988	3,121	3,248	3,371	3,489
38	672	951	1,345	1,647	1,902	2,126	2,329	2,516	2,689	2,853	3,007	3,154	3,294	3,428	3,558	3,683
40	708	1,001	1,415	1,734	2,002	2,238	2,452	2,648	2,831	3,003	3,165	3,320	3,467	3,609	3,745	3,876
42	743	1,051	1,486	1,820	2,102	2,350	2,574	2,781	2,973	3,153	3,323	3,486	3,641	3,789	3,932	4,070
44	779	1,101	1,557	1,907	2,202	2,462	2,697	2,913	3,114	3,303	3,482	3,652	3,814	3,970	4,120	4,264
46	814	1,151	1,628	1,994	2,302	2,574	2,819	3,045	3,256	3,453	3,640	3,818	3,987	4,150	4,307	4,458
48	849	1,201	1,699	2,080	2,402	2,686	2,942	3,178	3,397	3,603	3,798	3,984	4,161	4,331	4,494	4,652
50	885	1,251	1,769	2,167	2,502	2,798	3,065	3,310	3,539	3,753	3,956	4,150	4,334	4,511	4,681	4,846

Table 2: Hydrogen Pipeline Thermal Radiation ASDs (feet)

Diameter (in)	Pipeline Pressure (psi)															
	60	120	240	360	480	600	720	840	960	1,080	1,200	1,320	1,440	1,560	1,680	1,800
4	58	83	117	143	165	185	202	219	234	248	261	274	286	298	309	320
6	88	124	175	215	248	277	304	328	350	372	392	411	429	447	464	480
8	117	165	234	286	330	369	405	437	467	496	522	548	572	596	618	640
10	146	207	292	358	413	462	506	546	584	620	653	685	715	745	773	800
12	175	248	350	429	496	554	607	656	701	743	784	822	858	894	927	960
14	204	289	409	501	578	647	708	765	818	867	914	959	1,002	1,042	1,082	1,120
16	234	330	467	572	661	739	809	874	935	991	1,045	1,096	1,145	1,191	1,236	1,280
18	263	372	526	644	743	831	911	984	1,051	1,115	1,176	1,233	1,288	1,340	1,391	1,440
20	292	413	584	715	826	924	1,012	1,093	1,168	1,239	1,306	1,370	1,431	1,489	1,545	1,600
22	321	454	643	787	909	1,016	1,113	1,202	1,285	1,363	1,437	1,507	1,574	1,638	1,700	1,760
24	350	496	701	858	991	1,108	1,214	1,311	1,402	1,487	1,567	1,644	1,717	1,787	1,855	1,920

Table 3: Ethane Pipeline Thermal Radiation ASDs (feet)

Diameter (in)	Pipeline Pressure (psi)															
	60	120	240	360	480	600	720	840	960	1,080	1,200	1,320	1,440	1,560	1,680	1,800
4	87	123	174	213	246	275	301	325	348	369	389	408	426	443	460	476
6	130	184	261	319	369	412	451	488	521	553	583	611	639	665	690	714
8	174	246	348	426	492	550	602	650	695	737	777	815	851	886	920	952
10	217	307	434	532	614	687	752	813	869	922	971	1,019	1,064	1,108	1,149	1,190
12	261	369	521	639	737	824	903	975	1,043	1,106	1,166	1,223	1,277	1,329	1,379	1,428
14	304	430	608	745	860	962	1,053	1,138	1,216	1,290	1,360	1,426	1,490	1,551	1,609	1,666
16	348	492	695	851	983	1,099	1,204	1,300	1,390	1,475	1,554	1,630	1,703	1,772	1,839	1,904
18	391	553	782	958	1,106	1,236	1,354	1,463	1,564	1,659	1,749	1,834	1,916	1,994	2,069	2,142
20	434	614	869	1,064	1,229	1,374	1,505	1,626	1,738	1,843	1,943	2,038	2,128	2,215	2,299	2,380
22	478	676	956	1,171	1,352	1,511	1,655	1,788	1,912	2,028	2,137	2,242	2,341	2,437	2,529	2,618
24	521	737	1,043	1,277	1,475	1,649	1,806	1,951	2,085	2,212	2,332	2,445	2,554	2,658	2,759	2,856

3. High-Pressure Pipelines Transferring Flammable and Combustible Gasses (Blast Overpressure)

Table 1: Natural Gas Blast Overpressure ASDs (feet)

Diameter (in)	Pipeline Pressure (psi)								
	60	240	600	720	840	960	1,200	1,560	1,800
4	42	87	141	156	168	180	204	234	252
6	96	147	237	261	282	303	342	390	423
8	144	318	525	555	603	645	729	834	906
10	186	429	705	774	840	894	1,005	1,131	1,209
12	237	546	888	981	1,056	1,119	1,239	1,398	1,488
14	288	666	1,080	1,170	1,257	1,338	1,479	1,662	1,767
16	345	798	1,254	1,365	1,464	1,551	1,716	1,923	2,046
18	390	930	1,434	1,554	1,668	1,770	1,950	2,184	2,328
20	465	1,056	1,611	1,749	1,866	1,983	2,187	2,454	2,610
22	525	1,173	1,788	1,938	2,073	2,196	2,424	2,721	2,898
24	585	1,293	1,965	2,127	2,274	2,415	2,664	2,991	3,192
26	660	1,416	2,139	2,319	2,481	2,631	2,904	3,270	3,492
28	720	1,530	2,316	2,508	2,685	2,853	3,153	3,558	3,804
30	780	1,653	2,493	2,703	2,895	3,078	3,408	3,852	4,125
32	840	1,770	2,673	2,901	3,111	3,306	3,669	4,161	4,461
34	915	1,887	2,856	3,102	3,330	3,546	3,939	4,479	4,815
36	975	2,007	3,042	3,309	3,555	3,789	4,221	4,815	5,184
38	1,050	2,127	3,234	3,519	3,789	4,041	4,512	5,163	5,808
40	1,110	2,244	3,429	3,738	4,029	4,302	4,818	5,808	6,336
42	1,170	2,370	3,630	3,963	4,278	4,575	5,133	6,336	7,392
44	1,230	2,493	3,837	4,194	4,533	4,854	5,280	7,392	8,448
46	1,290	2,616	4,047	4,434	4,800	5,148	6,336	7,920	9,504
48	1,350	2,742	4,266	4,683	5,076	5,280	6,864	8,976	10,560
50	1,470	2,871	4,491	4,938	5,280	6,336	7,920	10,032	11,616

Table 2: Hydrogen Blast Overpressure ASDs (feet)

Diameter (in)	Pipeline Pressure (psi)					
	350	800	1,100	1,400	1,700	1,800
4	300	465	549	621	687	708
6	510	792	924	1,038	1,137	1,167
8	747	1,119	1,296	1,458	1,593	1,635
10	981	1,452	1,680	1,881	2,055	2,109
12	1,212	1,788	2,070	2,316	2,535	2,604
14	1,449	2,130	2,475	2,778	3,048	3,135
16	1,686	2,493	2,907	3,270	3,603	3,711
18	1,935	2,874	3,366	3,804	4,209	4,338
20	2,187	3,279	3,858	4,380	4,866	5,022
22	2,454	3,711	4,389	5,004	5,808	6,336
24	2,730	4,167	4,956	6,336	7,392	8,448
26	3,018	4,656	5,808	7,920	8,976	9,504

Table 3: Ethane Blast Overpressure ASDs (feet)

Diameter (in)	Pipeline Pressure (psi)					
	60	120	240	360	480	600
4	39	54	90	102	126	135
6	87	108	141	177	210	240
8	117	165	243	279	354	393
10	153	222	324	399	444	474
12	192	279	402	498	507	534
14	228	336	462	564	558	621
16	267	393	513	594	681	747
18	309	447	594	684	783	867
20	366	486	666	789	891	1,002
22	396	540	759	885	1,017	1,167
24	432	600	858	990	1,164	1,305

*Ethane is a liquid above 600 psi

Appendix 9B: Section 106 Delegation Memo



OFFICE OF COMMUNITY PLANNING
AND DEVELOPMENT

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
WASHINGTON, DC 20410-7000

MEMORANDUM FOR: State Historic Preservation Officers (SHPO) and Tribal Historic Preservation Officers (THPO), MAP- and OHP-approved Lenders

FROM: Danielle Schopp, Director, Office of Environment and Energy
Department Environmental Clearance Officer

SUBJECT: Authorization of MAP- and OHP-approved Lenders and Their Authorized Representatives to Initiate Section 106 Consultation For HUD Office of Housing Programs

EFFECTIVE DATE:

The Office of Housing at the U.S. Department of Housing and Urban Development (HUD) operates the Federal Housing Administration (FHA), providing mortgage insurance on mortgages for Single Family homes, Multifamily properties, and Healthcare facilities. Within Housing, the Office of Multifamily Housing Programs is responsible for the overall management, development, direction and administration of HUD's Multifamily Housing Programs, and the Office of Health Care Programs is responsible for the administration of HUD's Residential Care programs and Hospital Programs. HUD's FHA Programs are identified by section of the National Housing Act. (The Act.) Sections 220, 221(d)(4), 231, 213 and 241(a) of the National Housing Act provide FHA multifamily mortgage insurance for the new construction or substantial rehabilitation of multifamily rental housing. Sections 232 and 242 provide FHA mortgage insurance for new construction or substantial rehabilitation of healthcare facilities and hospitals. The Section 207/223(f) program insures mortgages for the purchase or refinancing of existing rental housing or healthcare facilities which may have been financed originally with conventional mortgages or equity. The Section 223(a)(7) program provides for streamlined refinancing of currently insured FHA loans.

All Housing FHA programs (except single family, 1-4 unit properties, which are generally categorically excluded from review under the National Environmental Policy Act (NEPA), not subject to related laws and authorities specified in HUD's environmental regulations) must comply with provisions of Section 106 of the National Historic Preservation Act (NHPA) and its implementing regulations, 36 CFR Part 800. In these projects, HUD receives applications from lenders and is responsible for completing environmental and Section 106 reviews under HUD's environmental regulations in 24 CFR Part 50 as part of its underwriting process. Early consideration of Section 106 is necessary to meet program timelines which often overlap with other funding and tax credit deadlines. In order to facilitate the review process, HUD has determined that it is consistent with 36 CFR 800.2(c)(4) for the lenders applying for mortgage insurance under these Programs to initiate Section 106 consultation with State Historic Preservation Officers (SHPO) and other consulting parties, except for Indian Tribes. HUD must conduct consultation with Indian Tribes. For the purposes of this Memorandum, Section 106 consultation may begin once HUD has issued an FHA number.

Effective immediately, the Department authorizes MAP- and OHP-approved lenders and their

authorized representatives to act on behalf of HUD to consult with SHPOs to initiate the Section 106 review process, identify and evaluate historic properties, and assess effects. Lenders using this option must include a copy of this Memorandum with their submission to SHPO.

If a project involves demolition of a building over 45 years old, new construction in or adjacent to a historic district, substantial ground disturbance¹, or exterior rehabilitation of a building more than 45 years old, lenders must retain a Qualified Historic Preservation Professional² in the discipline relevant to the project activities to prepare submissions to SHPO and manage consultation with interested parties and the public, as well as coordinate with HUD on HUD's consultation with Indian Tribes.

When consulting with the SHPO and others, the lenders or authorized representatives shall identify their project by the HUD program followed by the section of the Act and provide an appropriate contact person at both the lender's organization and the authorized representative hired to coordinate the review. Lenders and authorized representatives must consider timely comments received by HUD from Indian Tribes before reaching final determinations of effect.

The lender or authorized representative shall prepare documentation that meets 36 CFR 800.11 (d) or (e) and submit to SHPO for review and concurrence. If SHPO concurs with the finding of effect, the lender may enter the concurrence and supporting documentation into HUD's Environmental Review Online System (HEROS) and consider Section 106 complete, unless any of the considerations below apply.

HUD Office of Housing will remain legally responsible for all findings and determinations and will participate in and complete the Section 106 review when:

- It is determined during review that, in accordance with the *Criteria of Adverse Effect*, there may be an adverse effect on a historic property;
- There is a disagreement between the lender or their authorized representatives and the SHPO and/or THPO regarding identification and evaluation of historic properties and/or assessment of effects;
- There is an objection from tribes, consulting parties or the public regarding assessment of effects, the implementation of agreed upon provisions, or their involvement in a Section 106 review;
- There is the potential for a foreclosure situation per 36 CFR 800.9(b) or anticipatory demolition as specified in Section 110(k) of the National Historic Preservation Act; or
- There is government-to-government consultation with Indian tribes.

It is important that Section 106 reviews be conducted within the timeframes set forth in 36

¹ Does not include minor ground disturbance for installing posts for a fence, deck, ramp, handrail, or related structure; routine landscaping; or repaving a parking lot or sidewalk.

² A Qualified Historic Preservation Professional is one who meets the Secretary of the Interior's Professional Qualifications Standards for Archeology, History, Architectural History, Architecture, or Historic Architecture and has substantial experience in conducting Section 106 reviews of historic properties. Detailed information found at https://www.nps.gov/history/local-law/arch_stnds_9.htm



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WASHINGTON, DC 20410-7000

CFR Part 800 and in the Housing Multifamily and Healthcare FHA programs and that the exchange of documentation and consultations between the consulting parties be carried out in a consistent and predictable manner. To this end, HUD will coordinate with its MAP- and OHP-approved lenders to carry out the process set forth in this memorandum. HUD will provide guidance and periodic training on the implementation of the authorization. HUD will also monitor compliance with the authorization and prepare an annual report that summarizes the activities conducted under this authorization and make it publicly available on the HUD website.

If you have any questions regarding compliance with this Memorandum, please contact Sara Jensen, Multifamily Housing Program Environmental Clearance Officer, at sara.jensen@hud.gov or 206-220-5226. If you have any questions regarding HUD's Historic Preservation Program, please contact Nancy Boone, Federal Preservation Officer at Nancy.E.Boone@hud.gov or (202) 402-5718.

Affirmed by _____ Date _____
Brian D. Montgomery
Assistant Secretary of Housing and FHA Commissioner