

Heartland Greenway CFR 49 Part 195 Exceedance Summary



CFR 49 Part 195 Subpart	CFR 49 Part 195 Reference	CFR 49 Part 195 Requirement	Heartland Greenway Pipeline System Compliance Measures
A - General	CFR 195.11	Regulated rural gathering lines	Certain segments of the NHG system meet the definitions provided in this section. For these segments, NHG will meet this regulation as stated in 49 CFR 195.
C - Design Requirements	CFR 195.106	Internal Design Pressure - A design factor of 0.72 is permitted throughout the entire pipeline system which equates to the following required wall thicknesses utilizing a MOP of 2,200 psi: 6.625" pipe - 0.169" WT @ X60 Grade 8.625" pipe - 0.220" WT @ X60 Grade 12.75" pipe - 0.300" WT @ X65 Grade 16" pipe - 0.376" WT @ X65 Grade 20" pipe - 0.470" WT @ X65 Grade	NHG will exceed requirements as stated in 49 CFR 195 by increasing the nominal wall thickness for the pipe which results in a higher calculated MOP versus the proposed system MOP of 2,200 psi. NHG proposed wall thicknesses for each of the pipe diameters is as follows: 6.625" pipe - 0.250" WT @ X60 Grade - (Design Factor = 0.49) 8.625" pipe - 0.277" WT @ X60 Grade - (Design Factor = 0.57) 12.75" pipe - 0.344" WT @ X65 Grade - (Design Factor = 0.63) 16" pipe - 0.429" WT @ X65 Grade - (Design Factor = 0.63) 20" pipe - 0.535" WT @ X65 Grade - (Design Factor = 0.63) In addition, NHG will utilize pipe with an increased wall thickness for road crossings, bores, horizontal directional drilled crossings and within the fence line at facilities (MLV settings, Pump Station).
C - Design Requirements	CFR 195.111	Fracture propagation - CO2 pipeline system must be designed to mitigate the effects of fracture propagation.	NHG will exceed requirements as stated in 49 CFR 195. NHG engaged the services of Det Norske Veritas (DNV) to assist with an extensive fracture propagation and ductility analysis to determine the required metallurgical properties for the proposed pipeline system as well as utilize crack arrestors.
C - Design Requirements	CFR 195.112	New pipe - requirements associated with the installation of new pipe.	NHG will exceed requirements as stated in 49 CFR 195. All pipelines will be specified to API 5L, PSL-2 standards which mandates additional metallurgical requirements, inspections and record retention. In addition, all pipelines will be manufactured in accordance with the NHG developed Line Pipe specification.
C - Design Requirements	CFR 195.134	Leak detection - requirements associated with the design and installation of leak detection systems for pipelines transporting hazardous liquids.	NHG will exceed requirements as stated in 49 CFR 195, inclusive of computational pipeline monitoring (CPM) system requirements as well as advanced leak detection technology (i.e. fiber/acoustics/negative pressure wave) at various locations along the NHG.

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D - Construction	CFR 195.206	Material inspection - requires all components to be visually inspected at the site prior to installation.	NHG will exceed requirements as stated in 49 CFR 195 by performing inspection on all phases of the pipe manufacturing at each pipe mill to ensure full compliance with all quality control measures. In addition, NHG will perform factory acceptance tests (FAT) for each pre-manufactured component for facilities (pumps, compressors, dehydration units, etc.).
D - Construction	CFR 195.210	Pipeline Location - Right of way selected to avoid, as far as practicable, private dwellings, industrial buildings and places of public assembly and if not feasible, shall have minimum 12-inches of cover.	NHG will exceed requirements as stated in 49 CFR 195. NHG has made additional effort to minimize the collective impact and will utilize plume modeling for buffer zones where applicable that exceed part 195 as well as maintain a min of 60" of cover.
D - Construction	CFR 195.234	Welds: Nondestructive testing During construction, at least 10 percent of the girth welds made by each welder and welding operator during each welding day must be nondestructively tested over the entire circumference of the weld.	NHG will exceed requirements as stated in 49 CFR 195 by requiring 100 percent of all girth welds to be nondestructively tested.
D - Construction	CFR 195.248	Cover over buried pipeline 1) Below the cultivation line or to a depth of 30-inches, whichever is greater 2) Industrial, commercial and residential areas - 36" required 3) Drainage ditches at public roads and railroads - 36" required 4) Waterbodies 100-foot and greater - 48" required	NHG will exceed all requirements associated with pipeline cover: 1) NHG will have a minimum cover of 60" (5 feet) 2) NHG will have a minimum cover of 60" (5 feet) 3) NHG will have a minimum cover of 60" (5 feet) 4) NHG will utilize horizontal directional technology to cross waterbodies 100-foot and greater which will result in depth of cover far greater than the required 48" (NCO2V spec ~25')
D - Construction	CFR 195.250	Clearance between pipe and underground structures - minimum clearance is 12" with allowance of 2" clearance from drain tiles	NHG will exceed this requirement in most cases. NHG will utilize a 18" clearance between the outside of the pipe and the extremity of any underground structure, including drain tiles, where feasible. In the event 18" clearance cannot be achieved, NHG will meet the minimum requirements stated in 49 CFR 195.

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D - Construction	CFR 195.260	<p>Valves: Location</p> <ul style="list-style-type: none"> a) On suction end and discharge end of pump station b) On each pipeline entering or leaving breakout storage tank c) Non HVL pipelines - 15-mile max spacing in HCA areas / 20-mile max spacing in non HCA d) On each lateral takeoff from a pipeline e) On each side of water crossing(s) that are 100-feet wide (high water to high water) f) On each side of reservoir holding water for human consumption g) HVL pipelines - 7.5 mile max spacing in HCA areas / 20-mile max spacing in non HCA 	<p>The following is the NHG valve installation philosophy:</p> <ul style="list-style-type: none"> a) NHG will exceed requirement due to location of additional MLVs per risk assessment b) N/A c) N/A - CO2 considered to be HVL d) NHG will meet requirement e) NHG will meet requirement f) N/A - no reservoirs within proposed project footprint g) NHG will exceed requirement due to location of additional MLVs per risk assessment
E - Pressure Testing	CFR 195.304	Test Pressure - requires hydrotest for 4 hours at 125% MOP plus additional 4 hours at 110% MOP.	NHG will exceed this requirement by testing all pipeline systems for 8 hours at 125% MOP.
F - Operation and Maintenance	CFR 195.402	Procedural manual for operations, maintenance, and emergencies. Prepare and follow a manual of written procedures and reviewed at intervals not exceeding 15 months, but at least once each calendar year, and appropriate changes made as necessary to insure that the manual is effective. This manual shall be prepared before initial operations of a pipeline system commence.	NHG intends to have the plan developed well in advance of operations (90- 180 days prior to in- service) and vetted prior to operations. NHG will review the plan bi-annually, well in exceedance of the requirement to do so every 15 months and at least once each calendar year.
F - Operation and Maintenance	CFR 195.403	Emergency response training - Review and make appropriate changes at intervals not exceeding 15 months and at least once every calendar year.	NHG will review and make changes biannually. Training will include desktop drills and mock drills, detailed recording of the steps will be compared to procedures with follow-up meetings with participants to review, validate, correct and update the plan.
F - Operation and Maintenance	CFR 195.406	Maximum operating pressure	NHG will have soft alarms set below 110% to raise awareness for potential problem areas in advance of hard alarm that sets relief, shut down, etc.
F - Operation and Maintenance	CFR 195.407	Communications - reliable communication.	NHG will have primary communication sources in additional back-up power and communication to ensure constant communication.

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F - Operation and Maintenance	CFR 195.414	Inspections of pipelines in areas affected by extreme weather and natural disasters to commence within 72 hours after cessation of the event.	NHG intends to exceed this requirement by commencing inspections within 24 hours after cessation of the event.
F - Operation and Maintenance	CFR 195.412	Inspection of rights-of-way - inspections are required 26 times each calendar year with intervals not exceeding 3 weeks.	NHG will exceed this requirement by performing right of way inspections ideally every 10 days and not less than 26 times each calendar year with intervals not exceeding 3 weeks.
F - Operation and Maintenance	CFR 195.440	Public Awareness	Public awareness will conservatively include stakeholders beyond the modeled areas of potential impact. NHG will perform an HCA risk analysis at operations.
F - Operation and Maintenance	CFR 195.444	<p>Leak Detection</p> <p>(b) General. A pipeline must have an effective system for detecting leaks in accordance with §§ 195.134 or 195.452, as appropriate. An operator must evaluate the capability of its leak detection system to protect the public, property, and the environment and modify it as necessary to do so. At a minimum, an operator's evaluation must consider the following factors - length and size of the pipeline, type of product carried, the swiftness of leak detection, location of nearest response personnel, and leak history.</p> <p>(c) CPM leak detection systems. Each computational pipeline monitoring (CPM) leak detection system installed on a hazardous liquid pipeline must comply with API RP 1130 (incorporated by reference, see § 195.3) in operating, maintaining, testing, record keeping, and dispatcher training of the system.</p>	<p>NHG will exceed requirements as stated in 49 CFR 195 by utilizing multiple means to detect a leak via a combination of external systems:</p> <ul style="list-style-type: none"> -Fiber optic sensing cables (including acoustic and negative pressure wave data) -CO2 monitoring devices <p>And internal computational pipeline monitoring (CPM) systems on all pipeline diameters of the system:</p> <ul style="list-style-type: none"> -Real time transient model -Pressure/flow/temperature monitoring -Statistical Analysis <p>Evaluating drone technologies to supplement/validate leak detection.</p>
H - Corrosion Control	CFR 195.563	Cathodic protection must be activated within 1 year after the pipeline begins operation.	NHG will exceed this requirement by activating cathodic protection systems in stages along the right of way as the pipelines are backfilled and completed. A fully functional cathodic protection system will be operational well in advance of the 1 year requirement.
Miscellaneous	N/A	No requirement	An Internal Line Inspection deformation tool will be run through the entire pipeline system prior to start-up to ensure quality of installation.