Gas Pipeline Mapping:
Pipeline Information

Data Design (draft)

5/16/2019

1 TABLE OF CONTENTS

2 INTRODUCTION

2.1 PURPOSE

The California Department of Conservation, Division of Oil, Gas, and Geothermal Resources (DOGGR), Geographic Information Systems (GIS) Unit and DOGGR Facilities Program prepared this document to provide data standards and definitions for operators' submissions to DOGGR. This document describes the anticipated data attributes to be captured by DOGGR's system of record, WellSTAR, as it relates to gas pipelines within DOGGR's jurisdiction. *This document IS NOT a complete explanation or guide on how to submit data to DOGGR*.

2.2 BACKGROUND

In accordance with Public Resources Code section 3270.5, DOGGR recently updated its regulations concerning the operation of active gas pipelines in sensitive areas. DOGGR is now preparing new regulations that will enable digital mapping of these pipelines. The new regulations will be located at California Code of Regulations, title 14, section 1774.3, and will be accompanied by a set of data specifications. Once the regulations are finalized, operators shall comply with these data specifications when creating, maintaining, and submitting mapping data and locational information on their active gas pipelines in sensitive areas. The data tables described herein will be included in the data specifications that accompany the new regulations, DOGGR Publication No. M14 "Gas Pipeline Mapping System: Data Specifications and Submission Requirements."

DOGGR will use the mapping data and locational information submitted by operators in WellSTAR's Geographic Information System (GIS) subsystem. The WellSTAR GIS subsystem used for mapping pipelines is called the Gas Pipeline Mapping System (GPMS). As operators provide data on their pipelines to DOGGR, DOGGR will use the GPMS to organize the data into a searchable, centralized GIS database. DOGGR is creating the GPMS to compile and maintain up-to-date, accurate pipeline data, mapping data, and locational information on all active gas pipelines in sensitive areas within the state of California.

2.3 DISCLAIMER

This document is for informational and discussion purposes. The contents of this document and future system specifications are subject to change. *Not all system design information is described in this document*.

3 DATA TABLES

This section describes the various groups of data (a.k.a. "tables") that will collectively describe many attributes of pipelines. Both spatial and non-spatial data tables are included.

3.1 GENERAL SUBMISSION INFORMATION (NON-SPATIAL)

Table 1: General information for a pipeline data submission.

Topic	Field Name	Description	Req'd	Format	Values
General	**Contact Name**	The name of the person to contact if there are any problems processing the file.	Yes	Text	Any
General	**Contact Email**	The email of the person to contact if there are any problems processing the file.	Yes	Text	Any
General	**Contact Phone**	The phone of the person to contact if there are any problems processing the file.	Yes	Text	Any
General	**Org Code**	The organization code for the submitting organization.	Yes	Text	See WellSTAR (1-12 characters)
General	**Facility Type**	The facility type.	Yes	Text	Pipeline
General	**Description**	This field adds an easily identifiable description of this specific online form instance. The description will be visible on the landing page within the Forms in Progress and Forms Submitted tabs.	Yes	Text	Any

3.2 PIPELINE FACILITY INFORMATION (NON-SPATIAL)

Table 2: Table shows pipeline facility information describing the pipeline attributes.

Topic	Field Name	Description	Req'd	Format	Values
Pipeline	**Operator Link**	Assigned by the operator. This is the unique identifier used by the operator in their database and may or may not be the same used and assigned by DOGGR. Optional if PID is provided.	Yes, if exists.	Text	Any text.

Topic	Field Name	Description	Req'd	Format	Values
Pipeline	**Pipeline ID**	Assigned by DOGGR. This is a unique identifier for each pipeline facility. Multiple segments of the same pipeline will have the same value. Required if exists.	Yes, after DOGGR initially adds	Integer	Positive integers.
Pipeline	**Facility Name**	The name of the pipeline facility.	Yes	Text	Any
Pipeline	**Contact Name**	The name of the primary contact for the Facility. Filter by all Active People associated to the Organization.	No	Text	Any appropriate entity in WellSTAR.
Pipeline	**Purpose**	Functional purpose of the whole pipeline generally. Includes: GP=gas production, GT=gas treatment, GX=gas transport, H2S=hydrogen sulfide removal, CO2=carbon dioxide removal, CO=carbon monoxide removal, GD=gas dehydration, VR=vapor recovery, GI=gas injection, GIR=gas injection and recovery, GV=gas venting and flaring, EG=electrical generation, CG=cogeneration.	No	Text	Choose only 1 from {GP, GT, GX, H2S, CO2, CO, GD, VR, GI, GIR, GV, EG, CG}
Pipeline	**Status**	Identifies the status of the pipeline. I=In-service, O=out-of-service, B=abandoned in place, R=removed	Yes	Text	Choose only 1 from {I, O, B, R}
Pipeline	**Commodity**	Commodity within the Pipeline in general. O=oil, G=gas, W=water, S=steam, E=empty, X=other.	Yes	Text	Choose only 1 from {O, G, W, S, E, X}

Topic	Field Name	Description	Req'd	Format	Values
Pipeline	Commodity Detail	Additional detail description of the commodity within the pipeline: NG1 = dry, non-sour pipeline sale quality natural gas, NG2 = wet, non-sour natural gas, NG3 = dry, sour natural gas, NG4 = wet, sour natural gas, NG5 = dry, non-sour produced natural gas, PG=propane gas, SG=synthetic gas, HG = hydrogen gas, OTG = other gas, and EPG = empty gas.	No	Text	Choose one in {NG1, NG2, NG3, NG4, NG5, PG, SG, HG, OTG, EPG}
Pipeline	Odorized	Indicates the presence of mercaptans in a gas pipeline.	Yes	Text	True, False
Pipeline	Hazardous Material	Containing constituents in the fluid stream at concentrations that trigger additional health or safety requirements. Values include H2S = Sour crude or gas, NORM = naturally occurring radioactive material, OTH = other hazardous components, or NT = not present or at low concentration levels below regulatory exposure limits.	Yes	Text, multiples	Choose one or more in {H2S, NORM, OTH, NT}
Pipeline	Corrosive Materials	Containing constituents in the fluid stream that may accelerate corrosion of the pipeline. Values include: sour crude or gas (H2S), acid gas (CO2), water (H2O), other (OTH), and low or no concentration levels that do not require treatment by the operator to remove or mitigate (NC).	Yes	Text, multiples	Choose one or more in {H2S, CO2, H2O, OTH, NC}
Pipeline	County	The County name where the Pipeline location starts.	Yes	Text	See WellSTAR
Pipeline	Field	The DOGGR oil and gas field name.			See WellSTAR
Pipeline	Location Description	Description of location where the Pipeline starts.	No	Text	Any up to 500 characters
Pipeline	Latitude Start	Latitude in decimal degrees where the Pipeline starts.	Yes*	Numeric	Latitude, up to 6-8 significant figures.

Topic	Field Name	Description	Req'd	Format	Values
Pipeline	**Longitude Start**	Longitude in decimal degrees where the Pipeline starts.	Yes*	Numeric	Longitude, up to 6-8 significant figures.
Pipeline	**Latitude End**	Latitude in decimal degrees where the Pipeline ends.	No	Numeric	Latitude, up to 6-8 significant figures.
Pipeline	**Longitude End**	Longitude in decimal degrees where the Pipeline ends.	No	Numeric	Longitude, up to 6-8 significant figures.

3.3 PIPELINE SEGMENT INFORMATION (SPATIAL)

Table 3: Pipeline segment information table describes attributes of each segment of a pipeline.

Topic	Field Name	Description	Req'd	Format	Values
Segment	**Op ID**	The identifier (ID) assigned to a segment by the Operator.	No	Text	Any characters up to 16 total.
Segment	**Segment ID**	Assigned by DOGGR. This is a unique identifier for each segment of pipeline. Multiple segments of the same pipeline will have the same value. Required if exists.	Yes, after DOGGR initially adds	Integer	Positive integers.
Segment	**Status**	The status of pipeline segment. I=In-service, O=out-of-service, B=abandoned in place, R=removed	Yes	Text	Choose only 1 from {I, O, B, R}
Segment	**From Node**	Assigned by DOGGR. Node identifier (see Node table). The node from which a pipeline flows. The upstream node or node having the shorter flow distance from the producing well. For injection operations, the node having the longest flow distance to the injection well. Required for every pipeline segment.	Yes	Positive integer	Positive integer e.g. 12345

Topic	Field Name	Description	Req'd	Format	Values
Segment	**To Node**	Assigned by DOGGR. Node identifier (see node table). The node to which a pipeline flows. The downstream node or node having the longer flow distance from the producing well. For injection operations, the node having the shortest flow distance to the injection well. Required for every pipeline segment.	Yes	Positive integer	Positive integer e.g. 12346
Segment	**Jurisdiction**	Government entity with regulatory jurisdiction over the segment.	No	Text, multiples	Choose 1 or more in {DOGGR, CARB, CPUC, CSFM, CSLC, USDOT-PHMSA, BLM, Other}
Segment	**Urban**	Is any portion of the segment within an Urban Area?	Yes	Text	True, False
Segment	**Environmentally Sensitive**	Is any portion of the segment within an Environmentally Sensitive Area?	Yes	Text	True, False
Segment	**Sensitive**	Is any portion of the segment within a Sensitive Area?	Yes	Text	True, False
Segment	**Sensitive Receptors**	Additional or further description of the sensitive receptors in proximity to the segment. Required if the segment is in one or more Urban, Environmentally Sensitive, or Sensitive Area. Values include: S=school, H=hospital, R=residential, B=business, N=natural resources, L=history of chronic leaks, P=wildlife preserve, U=urban, C=Coastal Zone, D=Supervisor determined, O=other.	Yes, if sensitive	Text, multiples	Choose 1 or more in {S, H, R, B, N, L, P, U, C, D, O}

Topic	Field Name	Description	Req'd	Format	Values
Segment	**Function**	Functional category for the segment. Valid gas pipeline function category: GG = gas gathering, GI = gas injection, GP = gas processing, VR = vapor recovery, GC = casing gas line, GF = gas flow line, GS = non-odorized sales or processed gas line, GV=gas to vent or flare.	Yes	Text	Choose only 1 from {GG, GI, GP, VR, GC, GF, GS, GV}
Segment	**Function Other**	Required if Function = "Other". Description of segment function.	Yes, if other	Text	Any text.
Segment	**Diameter**	The predominant nominal pipe diameter of the segment in inches.	Yes	Integer	Positive whole number
Segment	**Material**	Material type of the segment. Pipeline construction material such as: Iron (I), Steel (S), Stainless steel (SS), Plastic (P), Plastic Composite (PC), Other (O). Choose only one value.	Yes	Text	Choose only 1 from {I, S, SS, P, PC, O}
Segment	**Material Other**	Required if Material = "Other". Description of the segment material.	Yes, if other	Text	Any text.
Segment	**Schedule**	Indicates the schedule. Refers to the standard manufactured wall thickness. Schedule relates to corrosion allowance and properties of stress and strains. Choose only one value.	Yes	Text	Choose only 1 from {SCH40, SCH80, SCH120, SCH160, Unknown, Other}
Segment	**Pressure Operating**	Normal operating pressure (psi) of the segment.	Yes	Numeric	Positive or negative decimal number
Segment	**Pressure MOP**	Maximum operating pressure (MOP) or maximum allowable operating pressure (MAOP) of the segment. Units of psi.	Yes	Numeric	Positive decimal number

Topic	Field Name	Description	Req'd	Format	Values
Segment	**Pressure Design**	Design pressure (psi) of the segment. Refers to original engineering design maximum pressure in pounds per square inch (PSI). Design pressure is established per the ASME code for a specific pipeline in the newly installed condition (without corrosion or defects).	No	Numeric	Positive decimal number
Segment	**Original Wall Thickness**	Original wall thickness (in) of the segment at time of installation.	Yes	Numeric	Decimal, up to 3 decimal points precision
Segment	**Grade**	Refers to the material strength and composition of different grades of steel. Only applies to pipelines constructed from steel material; leave blank for all other materials.	Yes	Text	Choose only 1 from {A, B, C, X42, X46, Unknown, Other}
Segment	**Routing**	Routing location relative to local surrounding environment surface, whereas: A = aboveground; B = belowground; AB = above and below, OW = over surface water, Ss = sub-sea, R = river/stream crossing. Choose only 1 value.	Yes	Text, multiples	Chose only 1 from {A, B, AB, OW, SS, R}
Segment	**Length Reported**	Reported nominal length (ft) of the segment.	Yes	Integer	Integer up to 99,999 feet
Segment	**Cathodic Protection**	Indicates whether pipeline segment has cathodic protection or not. Applies only to buried or submerged pipelines. If not applicable, set to 'False'.	Yes	Text	True, False
Segment	**Leak Detection**	Indicates whether pipeline segment has an installed leak detection or monitoring system.	Yes	Text	True, False

Topic	Field Name	Description	Req'd	Format	Values
Segment	**Leak Detection Description**	Required if Leak Detection = 'True'.	Yes, if exists.	Text	Any text, up to 40 characters.
Segment	**Location Quality**	Operator's determination of the categorical positional accuracy of the submitted pipeline segment. The categories of quality for position accuracy are: A <= 10 feet, B > 10 and <= 100 feet, C > 100 feet.	Yes	Text	Choose only 1 in {A, B, C}
Segment	**Install Year**	Known or estimated year the pipeline segment was installed originally.	Yes	Integer	4-digit integer

3.4   PIPELINE NODE (SPATIAL)

Table 4: Pipeline node information table describes each node along pipeline segments.

Topic	Field	Description	Req'd	Format	Values
Node	**OP Link**	Assigned by the operator. This is the unique identifier used by the operator in their database. The may or may not be the same as used by and assigned by DOGGR.	Yes, if exists.	Text	Any text.
Node	**Node ID**	Assigned by DOGGR. Unique identifier for each single pipeline node. Stays with a node for the life of the node. Operator shares responsibility to know and maintain the same identifier throughout the life of the pipeline segment.	Yes*	Integer	Positive integer number
Node	**Name**	Name of the plant, facility, or equipment being represented by the node. Assigned by the operator.	No	Text	Any text.
Node	**Position**	The position of the node relative to the pipeline segment to which it attaches. Positions include start or end (SE), intermediate (I), or standalone plant (P). Intermediate positions are any locations along a pipeline segment not at the segment's start or end. Choose only one position.	Yes	Text	Choose 1 from {SE, I, P}

Topic	Field	Description	Req'd	Format	Values
Node	**Type**	Describes the physical or virtual locations of interest connected to or associated with the pipeline segment to which the node attaches. Types of nodes include: C=compressor, D=engineering design property change, F=flare, FL=Flange, H=header, I=intersection in same pipeline, IP=intersection with different pipeline, M=meter, P=plant, PV=pressure vessel, S=separator, T=tank, TB=tank battery setting, V=valve, VL=virtual location, W=well, O=other. Choose only one type.	Yes	Text	Choose only 1 from {C, D, F, FL, H, I, IP M, P, PV, S, T, TB, V, VL, W, O}
Node	**Latitude**	Latitude in decimal degrees (minimum seven significant figures)	Yes	Decimal	Decimal, up to 6-8 significant figures.
Node	**Longitude**	Longitude in decimal degrees (minimum seven significant figures)	Yes	Decimal	Decimal, up to 6-8 significant figures.
Node	**Description**	Any relevant descriptive comment about the node.	No	Text	Any text

4 DEFINITIONS

1. "Attribute Data" means a data value that defines a property of an object. Examples of attribute data include a name, a value, or descriptive information for an object. The GPMS is designed to include attribute data for each feature entered into the system. This attribute data is connected to each feature and allows for querying, analysis, and visual display. For example, a pipeline segment feature will include attribute data describing its current operating status and its maximum allowable operating pressure.

2. "Geographic information system" or "GIS" means a computer-based system of software and hardware that is used to store, analyze, and present spatial data.

3. "Non-spatial data" means attributes that define an object's properties other than its spatial properties.

4. "Pipeline" for the purposes of this document means a continuous routing of pipe to or from a facility and from or to another facility. A pipeline has one assigned function and consists of at least one segment.

5. "Pipeline node" is a type of GPMS feature and means a physical object or virtual point of interest along the length of a pipeline segment. A node can represent something that is physically connected to or logically associated with a pipeline segment. There are three types of pipeline nodes: start nodes, intermediary nodes, and end nodes. Nodes can represent physical locations (like

processing plants) or virtual locations along a pipeline, such as the location where a pipeline enters a sensitive area.

6. "Pipeline segment" is a type of GPMS feature and means a linear object representing part of a pipeline. In the GPMS, a pipeline is represented by one or more line segments, each known as a pipeline segment. Each pipeline segment begins and ends at pipeline nodes.

7. "Sensitive area" is a type of GPMS feature and means a location as defined in California Code of Regulations, title 14, section 1760, subdivision (r).

8. "Spatial data" or "geospatial data" means geographic information having an association with objects and locations relative to the earth.

9. "Unique identifier" or "ID" is a name or number assigned by DOGGR to each operator, pipeline segment, and pipeline node. Once assigned by DOGGR, an ID will not change. Operators are responsible for knowing and maintaining the same ID throughout their GPMS submittal.

To be added:

- Details on file types that will contain this data
- File naming conventions
- Submission guidelines (website, formats)