Request

Documentation showing how non-HCA/non-MCA status was calculated for accident site, including KM's determination of PIR at accident site.

Response

The potential impact Radius (PIR) is calculated in accordance with the Kinder Morgan Pipeline Integrity Management Program for Subpart O (IMP) in Section 2.7.5.

> 49 CFR §192.903 defines the potential impact radius (PIR) as:
>
> The radius of a circle within which the potential failure of a pipeline could have significant impact on people or property.
>
> PIR is determined by the formula: PIR (feet) = $r = g*(p*d^2)^{½}$
>
> Where:
>
> p = MAOP (psi)
>
> d = outside diameter (inches)
>
> g = 0.69 for natural gas factor (this number will vary for other gases depending upon their heat of combustion)

Also, the IMP section 2.8.6.1 states how the PIR is calculated and identifies the buffer for the PIR.

> In order to establish HCAs, **Compliance Systems** uses the HCA determination tool to calculate the PIR. In the PIR equation, KM uses a factor of 0.69 for natural gas with Btu less than or equal to 1,100. For natural gas with a Btu greater than 1,100, KM requires a factor[1] of 0.73.
>
> To account for any GIS inaccuracies, KM has elected to add a 40-foot buffer to each PIR. **Risk Engineering** or **Field Operations** may request that a route be exempted from the 40-foot PIR buffer. The exemption process is described in **O&M Procedure 220 – Class Location and HCA/MCA Determination** (*see* DR-09B, Bates numbers EPNG Line 2000-0000373 – 0000385).

For the accident site the outside diameter for this pipeline is 30" and the MAOP is 944. Using a gas factor of 0.69 we get a PIR distance of 636 feet. Adding the 40 feet buffer buffer to the PIR distance of 636, we get a Total PIR used in our calculation of 676.

The blue Total PIR circles of 676 feet in the screen shot below touches the house boundary on either side showing that there is only 1 house in the Total PIR which is less than the regulatory threshold for an MCA (> 5)or and HCA (>20) . In addition, there are no MCA Highways in the general area that would trigger this being an MCA.

Map Legend:

- Green pipeline range is non-HCA area.
- The blue circles are the Total PIR (which is the PIR distance + a 40 foot buffer tolerance)

[1] Michael Baker Jr., Inc. and C-FER Technologies. (2005). Potential Impact Radius Formulae for Flammable Gases Other Than Natural Gas Subject to 49 CFR 192

- The translucent buffer around the pipeline is the Total PIR buffer
- Blue buildings are non-DOT structures. (not intended for human occupancy)

Green buildings are residential homes.

Request

Class location calculations containing accident site.

Response

Class locations are calculated in accordance with O&M 220 (Class Location and HCA/MCA Determination) including the Table 2 – Class Location Area:

Class	Criteria
Class 1	a. 10 or fewer buildings within the class location unit b. All offshore pipelines
Class 2	More than 10 and fewer than 46 buildings within the class location unit
Class 3	a. 46 or more buildings within the class location unit b. An area where the pipeline lies within 300-feet of either a building or a small, well-defined outside area (such as a playground, recreation area or other place of public assembly) that is occupied by 20 or more persons at least 5 days a week for 10 weeks in any 12-month period. The days and weeks need not be consecutive. In this case, the Class 3 area ends 300-feet on either side of the qualifying commercial building or outside area.
Class 4	Buildings with four or more stories above ground are prevalent within the class location unit. More than 50% of the structures in the class location unit must be four or more stories for the area to be Class 4.

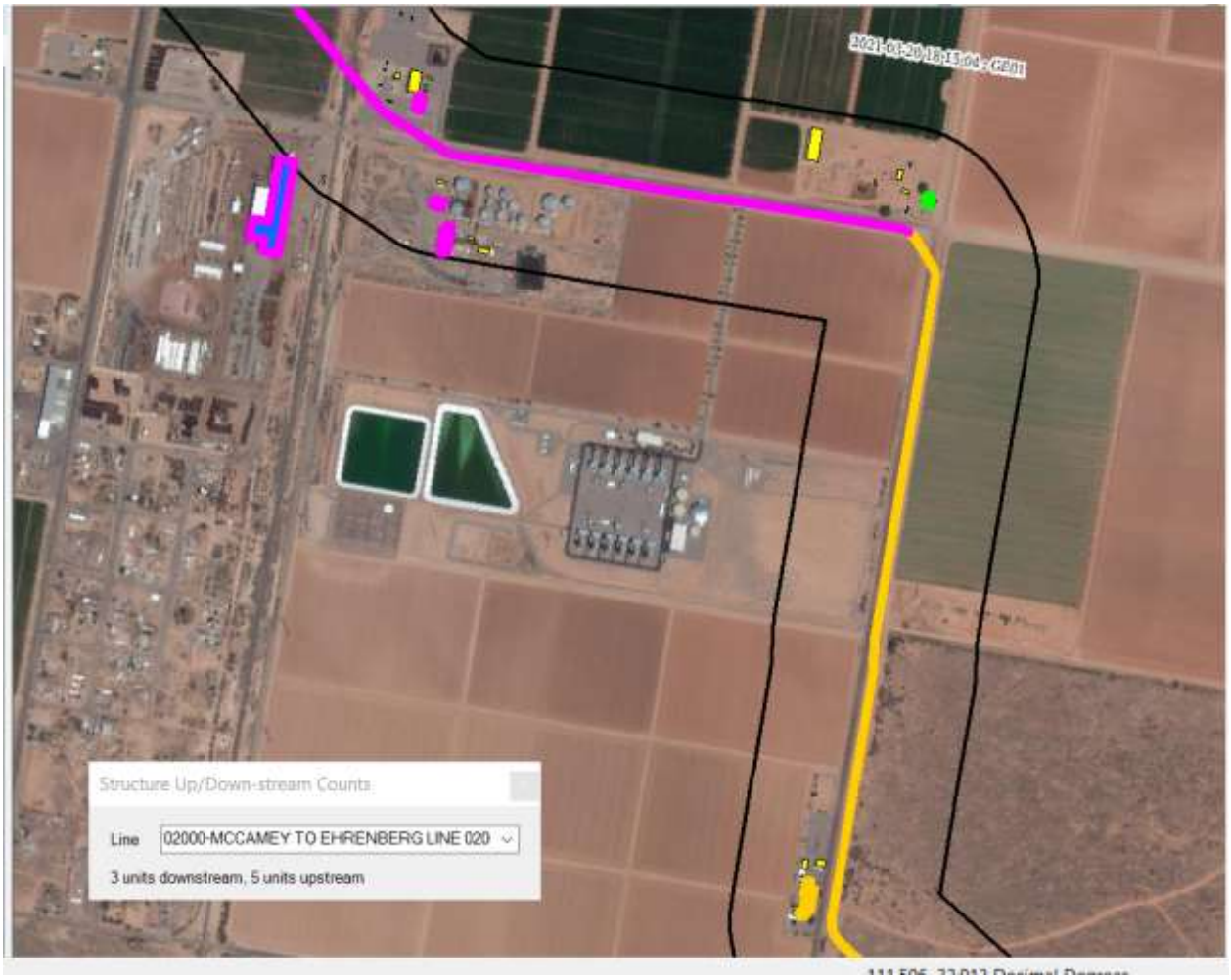
Here is the determination of Class 1 for the accident site.

From the house (in green) go 1 mile upstream and 1 mile downstream. The insert box below in the screenshot shows the number of structures being counted in each direction.

Counting the house (in green) and going downstream there are a total of (3) homes and counting the house (in green) and going upstream there are 3 non-qualifying businesses (less than 20 people) and one qualifying business (greater than 20 people) which give us a total of (5) structures going upstream. Therefore, in both directions (2 miles in total) there are less than 10 structures which makes this class I.

Note: 10 or fewer buildings within the class location unit (sliding mile) is a class I
Structures colors below:

- Pink outline with solid blue in the middle/fill is a commercial building 20+ people, 5 days/week 10 weeks/yr.
- Solid pink structures are commercial buildings less than 20 people, 5 days/week; 10 weeks/yr.
- Yellow are not intended for human occupancy (barns or sheds)
- Green is the residents/house being selected
- Solid Gold are residence/homes being selected on the downstream


Structure Up/Down-stream Counts
Line
02000-MCCAMEY TO EHRENBERG LINE 020
3 units downstream, 5 units upstream

Request

Supplement to DR-81: Distance from centerline of L2000 to qualified business (>20 persons, 5 days/wk, 10 wk/yr) – this length visibly appears to be much greater than 300 feet, but need actual distance to complete documentation on class location calculation.

Response

The picture below is from our class calculation calculator. The distance highlighted in the table of 660 feet is the distance to this structure. Also, the black line is the 660 foot class location buffer for this pipeline.