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Subject: Technical Letter: Opinion Regarding Options 6.1 and 6.2 for the *Centro de Gestión de Residuos Sólidos en el Bordo Poniente*

Dear Dr. Alcocer:

This document is in response to your recent communications with Dr. Bernardo Lisker regarding the latest locations proposed for the *Centro de Gestión de Residuos Sólidos en el Bordo Poniente* (hereinafter referred to as “the facility”). As you know, MITRE has been assisting the aviation authorities of Mexico in the aeronautical assessment of several alternative locations for the facility (e.g., Option 3, Option 4.1, Option 4.2, and Option 5) on future aircraft operations at Nuevo Aeropuerto Internacional de la Ciudad de México (NAICM) and existing operations at Aeropuerto Internacional de la Ciudad de México (AICM).

MITRE was recently informed by the Dirección General de Aeronáutica Civil (DGAC) that the above-mentioned options have been discarded. Afterwards, CONAGUA, through you, informed MITRE that two new potential locations for the facility (“Option 6.1” and “Option 6.2”) are being considered and that CONAGUA would like MITRE to express its aeronautical opinion (with the authorization of MITRE’s contract administrator, i.e., Grupo Aeroportuario de la Ciudad de México). The polygons for Option 6.1 and Option 6.2 are defined by coordinates contained in the file named “Opción6.2Tarquina.pdf” that you recently provided to Dr. Lisker. Both Option 6.1 and Option 6.2 overlap the eastern portion of Option 4.2. That file also contains the ground elevation of Option 6.1 and Option 6.2.¹ These coordinates and ground elevations, and a graphic depicting the location of the polygons, are provided in the Appendix to this document.

¹ Note that this file also contains coordinate and ground elevation information for Option 4.1 and Option 4.2.

The objective of this Technical Letter is to provide MITRE's overall opinion on the appropriateness of locating the facility at Option 6.1 or Option 6.2, from an aeronautical perspective. MITRE has not conducted a new full assessment because the facility at Option 6.1 or Option 6.2 would be located very close to and overlapping Option 4.2. Therefore, MITRE's opinion on Option 6.1 and Option 6.2 is based on the results of its previously-conducted, detailed assessment of Option 4.2. MITRE considers this to be a reasonable way to provide Mexico's authorities with a fast assessment.

MITRE's previously-conducted assessments included a determination of whether the facility, located at Option 3, Option 4.1, Option 4.2, or Option 5 would impact key instrument approach and departure procedures, One Engine Inoperative (OEI) procedures (also known as "engine-failure" operations), Minimum Vectoring Altitude (MVA) sectors, and International Civil Aviation Organization (ICAO) Annex 14 Obstacle Limitation Surfaces (OLS). MITRE's assessments considered 40-meter-high smokestacks at each of the previously proposed facility location options, as well as the elevation of the ground at each of the options, based on information provided by the Mexican authorities at that time. In addition, MITRE analyzed the facilities at each of the options using the most up-to-date information regarding the planned runway configuration and runway threshold elevations at NAICM². Information on the runway locations, runway threshold elevations, and instrument approach and departure procedures for AICM was obtained from Mexico's Aeronautical Information Publication (AIP).

Note that the elevation of the ground at Option 4.2 provided to MITRE at the time of its previously-conducted assessments was 2223.82 m above Mean Sea Level (MSL). However, and of some concern, the ground elevation information contained in the file that you recently provided for Option 4.2 is clearly higher than what was previously provided to MITRE, ranging between 2230.7390 m and 2232.0100 m above MSL. Option 6.1 and Option 6.2 have similar ground elevations. MITRE warns all those reading this Technical Letter that modifications to ground elevation and runway threshold elevation (see MITRE's baseline in footnote number 2) are important factors in this analysis and advise that this opinion is based on data provided to MITRE.

For reference, the results of MITRE's assessments of the above-mentioned facility options are contained in the following key documents:

- MITRE Technical Letter F500-L16-040: *Assessment of Centro de Gestión de Residuos Sólidos en el Bordo Poniente Near NAICM*, dated, 29 July 2016
- Enclosure 1 to MITRE Technical Letter F500-L17-030: *Assessment of Centro de Gestión de Residuos Sólidos en el Bordo Poniente: Options 3, 4.1, 4.2, and 5*, dated 11 January 2017

² Opening-day runway threshold elevations (provided by Grupo Aeroportuario de la Ciudad de México): 35R = 2228.25 m; 36L = 2228.50 m; 01R = 2232.00 m. Future runway threshold elevations (estimated by MITRE): 35L = 2227.00 m; 36R = 2227.00 m; 01L = 2227.00 m. Elevations are above Mean Sea Level.

- MITRE Technical Letter F500-L17-053: *Centro de Gestión de Residuos Sólidos en el Bordo Poniente: Feedback Regarding Aeroméxico's Takeoff Performance Analysis*, dated 7 April 2017
- MITRE Technical Letter F500-L17-065: *Summary of MITRE's Aeronautical Assessment of the Centro de Gestión de Residuos Sólidos en el Bordo Poniente*, dated 8 May 2017

Summary. Based on MITRE's aeronautical assessment of the facility location at Option 4.2, 40-meter-high smokestacks should not constitute physical obstacles to normal instrument approach and departure procedures at either NAICM or AICM. Furthermore, based on the results of Aeroméxico's takeoff performance analysis considering an engine failure, the facility located at Option 4.2 should not affect takeoff procedures at either NAICM or AICM. Therefore, based on the ground elevation at Option 4.2 utilized by MITRE in its previously-conducted assessments (i.e., 2223.82 m above MSL), the elevation of 40-meter-high smokestacks at Option 6.1 and Option 6.2 should not exceed 2263.82 m above MSL.

It is highly recommended that the authorities ensure that the smokestacks do not exceed the above-mentioned MSL elevation. That would yield at most around 30-meter-high smokestacks unless the ground at the facility is lowered to the MSL elevation provided to MITRE earlier (2223.82 m).

Given that the location of Option 6.1 and Option 6.2 is very close to and overlaps Option 4.2, and as long as the last paragraph is watched carefully, MITRE's overall opinion from an aeronautical perspective is that locating the facility at Option 6.1 or Option 6.2 should not have an adverse impact on operations at NAICM or AICM.

Please do not hesitate to contact me if you have any questions.

Sincerely,



Ing. Robert W. Kleinhans
Project Technical Coordinator

cc:

Lic. Yuriria Mascott, SCT
Mtro. Roberto Ramírez, CONAGUA
CTA. Miguel Peláez, DGAC
Dr. Bernardo Lisker, MITRE

Appendix

Location and Coordinates of Option 6.1 and Option 6.2

Figure 1 shows the location of Option 6.1 (in red color) and Option 6.2 (in purple color) in relation to NAICM and AICM, as well Option 4.2. (Option 4.1 is shown for reference purposes only.) Table 1 and Table 2 provide the coordinates and ground elevation of Option 6.1 and Option 6.2, respectively, as provided by CONAGUA most recently.

Again, based on the ground elevation at Option 4.2 utilized by MITRE in its previously-conducted assessments (i.e., 2223.82 m above MSL), **the elevation of 40-meter-high smokestacks at Option 6.1 or Option 6.2 should not exceed 2263.82 m above MSL.**

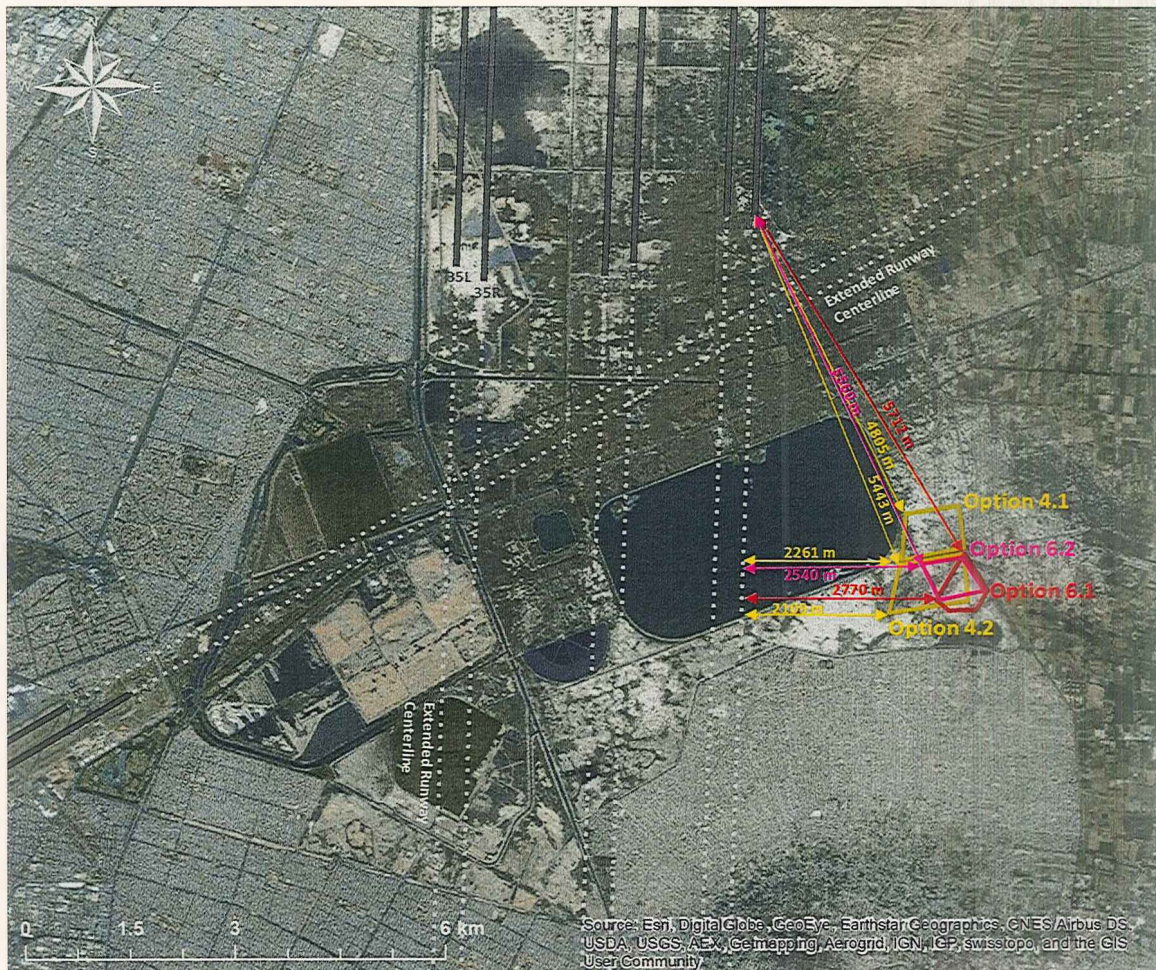


Figure 1. Location of Option 6.1 and Option 6.2 (CONAGUA’s latest data)

Table 1. Coordinates and Ground Elevation for Option 6.1

Point	World Geodetic System 1984 (WGS 84) Universal Transverse Mercator (UTM) Coordinates		Ground Elevation (Meters Above MSL)
	X	Y	
1	506427.0738	2151281.1212	2231.2020
2	506583.7883	2151559.3780	2231.2550
3	506257.0758	2152101.5566	2232.0100
4	506226.8011	2152051.4882	2231.3810
5	506159.8979	2151941.1235	2231.7760
6	506094.8133	2151835.2968	2231.7100
7	506054.1665	2151766.4692	2231.5880
8	506005.6360	2151680.5846	2231.3780
9	505955.4751	2151593.3786	2231.2070
10	505898.4509	2151499.6193	2231.2080
11	505876.1271	2151463.1134	2231.1060
12	505862.8649	2151438.0836	2231.0950
13	505862.0789	2151419.0658	2230.9200
14	505874.4701	2151407.3749	2230.8850
15	505939.8630	2151355.4857	2230.8150
16	505975.6354	2151324.3643	2230.8050
17	505993.8899	2151310.1255	2230.8050
18	506043.7519	2151272.1854	2230.6940
19	506064.6743	2151266.7508	2230.7150
20	506130.6042	2151276.1875	2230.8270
21	506250.5786	2151281.8436	2230.9500

Table 2. Coordinates and Ground Elevation for Option 6.2

Point	World Geodetic System 1984 (WGS 84) Universal Transverse Mercator (UTM) Coordinates		Ground Elevation (Meters Above MSL)
	X	Y	
1	505650.2046	2151948.0911	2231.0870
2	506223.5720	2152052.2022	2231.3950
3	506538.9749	2151562.5020	2231.2320
4	505906.7503	2151422.0856	2230.9900