D-25733

Earth Observing System (EOS)
Tropospheric Emission Spectrometer (TES)

TES L2_Products PGE Specification
PGE Definition and Production Rules

Release 15

Version 1.2

Ruth Monarrez, Mariyetta Madatyan, Scott Gluck, James Wood

March 21, 2019

JPL
Jet Propulsion Laboratory
California Institute of Technology
Pasadena, California

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Section	Heading	Description	Release	Date
2.1.2	Release Specific Information	Updated: CR 4088 Supplemental Product	11	12/3/2007
2.2.1	Input and Output Files	1. Added the Supplemental ESDT 2. Updated the MCF version from 003 to 004	11	12/3/2007 1/10/2008
2.2.2.2	Database Table Attributes	Add L2_Nonretrieved_Species table	11	12/3/2007
2.3	PGE Execution	1. Add the Supplemental information to the command-line 2. Changed the file version information from: Std Prod: F04_04 to F05_05 Summ: F01_04 to F02_05	11	12/3/2007 9/26/07
2.3.1.2	Parameter Definition File	1. Add the Supplemental information 2. File Version: Supp: F02_05	11	12/3/2007 9/26/07
2.3 2.3.1.2	PGE Execution Parameter Definition File	Updated Content Version Standard F05_06 Supp: F02_06 Summ: F02_06	11.2	10/03/08
2.2.1	Input and Output Files	1. Updated content version (cc) to 07	11.3	2/17/2009
2.3	PGE Execution	1. Changed the content version information from: Std Prod: F05_05 to F05_07 Summ: F02_05 to F02_07 Supp: F02_05 to F02_07	11.3	2/17/2009
2.3.1.2	Parameter Definition File	1. Updated content version from: ContentVersion: F05_05 to F05_07 SummContentVersion: F02_05 to	11.3	2/17/2009

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		F02_07 SuppContentVersion: F02_05 to F02_07		
2.1.1	PGE Description	Updated Species List table	12.0	12/08/2009
2.1.2	Release Specific Information	Updated for R12 CQ items	12.0	12/08/2009
2.2.1	Input and Output Files	Updated for new input and output files	12.0	12/08/2009
2.3.1.2	Parameter Definition File	Updated for CO2 and NH3 MCF Logical IDs	12.0	12/08/2009
2.2.1 2.3 2.3.1.2	Input and Output Files PGE Execution Parameter Definition File	Update for CO2 Lite Processing	12.0	9/21/2010
2.3	PGE Execution	Updated to include netCDF augmentation instructions	12.0	11/10/10
2.3.1	Parameter Definition File	Updated for OCS, PAN, HCN, IRK, HCOOH, CH3OH	15.0	3/21/2019

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Introduction

1.1 Identification and Scope

This document describes the production rules of the TES Level 2 L2_Products PGE, as well as brief descriptions of its functionality. The intent is to include enough information about the PGE for the SIPS to be able to efficiently and intelligently coordinate and run this PGE, such as staging requirements, database usage, and runtime parameters. This document is specific to Release 12.

The database files used in L2_Products PGE processing are described only at a high level in this document. More detail on the database files used can be found in the Database Definition document. Output files are written as HDFEOS5 files using HDFEOS5. Therefore, there will be no SIS for L2_Products PGE for R12.

1.2 Controlling Documents

1. Level-2 Functional Requirement Document, TES DFM #1032
2. TES Ground Data System Database Definition, Release 12, September 2009, JPL D-23034
3. SDP Toolkit User Guide, version 2.0, GSFC document number 333-EMD-001, Rev 03 (can be found at website: http://newsroom.gsfc.nasa.gov/sdptoolkit/toolkit.html)
4. TES SDPS Framework Programmer's Guide, Version 3.0, D-20207
5. HDF-EOS reference (TBD)
6. Science Data Processing, Data Products Specification, Version 12.0, D-22993 (ClearCase version: /vobs/doc/SDPD/DPS)
7. L2_SIS_R9, October 2005, Version 1.0
8. L2 Retrieval PGE Spec R12, Version 1.1

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2 Production Rules

2.1 Overview

2.1.1 PGE Description

L2_Products PGE is Sun based and creates the TES Level 2 standard products in HDF-EOS 5 format. The products contain metadata information and specie related data as described in the SDP Data Products Specification.

A unique ESDT is produced for each molecular species for each observation type (limb/nadir) as outlined below. For a complete set of species retrieved, please refer to the L2 Retrieval PGE Spec.

Table 1

Species	H2O	O3	CH4	CO	HDO	AtmT	N2O	CO2	NH3	HCOOH	CH3OH	HCN	OCS	PAN
Nadir Swath Object	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Limb Swath Object														

X = available
Note: An Ancillary, Summary, Supplemental and CO2Lite product will also be produced.

2.1.2 Release Specific Information

Significant changes from Release 12.0 include:

CR4303: Add CO2 to the standard products. Added TL2CO2N, TL2CO2NS to the list of ESDT's.
CR4306: Add NH3 to the standard products. Added TL2CO2N, TL2CO2NS to the list of ESDT's.,
CR4316: Added TropopausePressure to all standard products.
CR4317: Moved OzoneTroposphericColumn, OzoneTroposphericColumnError, OzoneTroposphericColumInitial from Ancillary to all standard products.
CR4328: Add OzoneIRFK to TES L2 Products
CR4319: Generate CO2 monthly product on reduced grid
CR4416: Add calibration scheme designator to L2 standard data products
CR4437: Update L2 Ancillary Products Reading H2O_HDO Matrix File

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2.2 Files and Databases

2.2.1 Release 15 File Format and ESDT Versions

Species	File Format Version	ESDT Version
H2O	F06_08	TL2H2ON.008.MCF TL2H2ONS.005.MCF
HCOOH	F06_08	TL2FORN.008.MCF TL2FORNS.005.MCF
HCN	F06_08	TL2HCNN.008.MCF TL2HCNNS.008.MCF
O3	F06_08	TL2O3N.008.MCF TL2O3NS.008.MCF
CH4	F06_08	TL2CH4N.008.MCF TL2CH4NS.008.MCF
CO	F06_08	TL2CON.008.MCF TL2CONS.008.MCF
HDO	F06_08	TL2HDON.008.MCF TL2HDONS.008.MCF
IRK	F06_08	TL2IRKN.008.MCF TL2IRKNS.008.MCF
CH3OH	F06_08	TL2MTLN.008.MCF TL2MTLNS.008.MCF
AtmT	F06_08	TL2ATMTN.008.MCF
N2O	F06_08	TL2N2ON.008.MCF TL2N2ONS.008.MCF
NH3	F06_08	TL2NH3N.008.MCF TL2NH3NS.008.MCF
OCS	F06_08	TL2OCSN.008.MCF TL2OCSNS.008.MCF
PAN	F06_08	TL2PANN.008.MCF TL2PANNS.008.MCF
CO2	F06_08	TL2CO2N.008.MCF TL2CO2NS.008.MCF
Ancillary	F06_08	TL2ANC.008.MCF TL2ANCS.008.MCF
Summary	F03_08	TL2SUM.008.MCF TL2SUMS.008.MCF

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Supplemental	F02_08	TL2SUP.008.MCF TL2SUPS.008.MCF
CO2Lite	F01_08	TL2CO2LN.008.MCF

2.2.2 Input and Output Files

The following table lists all input and output files used in this PGE. All .MCF files shall exist in ***./MCF*** directory and all .met and .he5 files shall exist in a ***./out*** directory. In the Filename column, <RunId> indicates the numeric value for run. The format and content version are F01_01 because this is how the test cases are set.

Table 2

ESDT name	Filename	Description	Input/ Output	File Size (bytes)
N/A	MatrixProducts_TATM_Run<RunId>_Seq<Seq>_Scan<Scan>	File containing the matrices for writing the product.	Input	144040
N/A	MatrixProducts_H2O_Run<RunId>_Seq<Seq>_Scan<Scan>	File containing the matrices for writing the product	Input	144039
N/A	MatrixProducts_O3_Run<RunId>_Seq<Seq>_Scan<Scan>	File containing the matrices for writing the product	Input	144038
N/A	MatrixProducts_CH4_Run<RunId>_Seq<Seq>_Scan<Scan>	File containing the matrices for writing the product	Input	144039
N/A	MatrixProducts_CO_Run<RunId>_Seq<Seq>_Scan<Scan>	File containing the matrices for writing the product	Input	144038
N/A	MatrixProducts_NO2_Run<RunId>_Seq<Seq>_Scan<Scan>	File containing the matrices for writing the product	Input	144040
N/A	MatrixProducts_HNO3_Run<RunId>_Seq<Seq>_Scan<Scan>	File containing the matrices for writing the product	Input	144040
N/A	MatrixProducts_HDO_Run<RunId>_Seq<Seq>_Scan<Scan>	File containing the matrices for writing the product	Input	144039
N/A	MatrixProducts_H2O_HDO_Ratio_Run<RunId>_Seq<Seq>_Scan<Scan>	File containing the matrices for writing the product	Input	18002
N/A	MatrixProducts_CO2_Run<RunId>_Seq<Seq>_Scan<Scan>	File containing the matrices for writing the product	Input	144039
N/A	MatrixProducts_NH3_Run<RunId>_Seq<Seq>_Scan<Scan>	File containing the matrices for writing the product	Input	144039
N/A	MatrixProducts_CO2Lite_Run<Ru	Files containing the matrices for writing the	Input	1186

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	nId>_Seq<Seq>_Scan<Scan>	product. All files for specified calendar month should be staged.		
N/A	L2_FileKeys.asc	File used by the Autofilename Generator tool (./in/)	Static Input	227
N/A	L2_FileDef.asc	File used by the Autofilename Generator tool (./in/)	Static Input	4473
N/A	L2_Products_def.dat	Parameter definition file containing the Parameter_Control, Program_Control, L2_Standard_Products, and the MCFLogicalId (map between ESDT Short name and MCF Logical ID) information.	Static Input	3957
N/A	L2_Products_param_<RunId>.dat	Parameter file containing the RunId. The RunId can also be supplied via the command line as opposed to a file.	Static Input	253
N/A	pcf_test.dat	Toolkit PCF file (SIPS template plus Level 2 specific information) (./PCF/)	Static Input	22005
N/A	TES.MCF	Contains TES-specific metadata specification Shared with L1B. (./MCF/)	Static Input	18968
TL2ATMTN	TL2ATMTN.008.MCF	Atmospheric temperature nadir MCF file template needed for metadata . (./MCF/)	Static Input	7232
TL2ATMTL	TL2ATMTL.008.MCF	Atmospheric temperature limb MCF file template needed for metadata. (./MCF/)	Static Input	7232
TL2CH4N	TL2CH4N.008.MCF	CH4 nadir MCF file template needed for metadata. (./MCF/)	Static Input	7232
TL2CH4L	TL2CH4L.008.MCF	CH4 limb MCF file template needed for metadata. (./MCF/)	Static Input	7232
TL2CON	TL2CON.008.MCF	CO nadir MCF file template needed for metadata. (./MCF/)	Static Input	7232
TL2COL	TL2COL.008.MCF	CO limb MCF file template needed for metadata. (./MCF/)	Static Input	7232
TL2H2ON	TL2H2ON.008.MCF	H2O nadir MCF file template needed for metadata. (./MCF/)	Static Input	7232
TL2H2OL	TL2H2OL.008.MCF	H2O limb MCF file template needed for metadata. (./MCF/)	Static Input	7232
TL2HNO3L	TL2HNO3L.008.MCF	HNO3 limb MCF file template needed for metadata. (./MCF/)	Static Input	7232
TL2NO2L	TL2NO2L.008.MCF	NO2 limb MCF file template needed for metadata. (./MCF/)	Static Input	7232
TL2O3N	TL2O3N.008.MCF	O3 nadir MCF file template needed for metadata. (./MCF/)	Static Input	7232

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TL2O3L	TL2O3L.008.MCF	O3 limb MCF file template needed for metadata. (./MCF/)	Static Input	7232
TL2HDON	TL2HDON.008.MCF	HDO nadir MCF file template needed for metadata. (./MCF/)	Static Input	7232
TL2HDOL	TL2HDOL.008.MCF	HDO limb MCF file template needed for metadata. (./MCF/)	Static Input	7232
TL2ANC	TL2ANC.008.MCF	Ancillary MCF file template needed for metadata. (./MCF/)	Static Input	7232
TL2SUM	TL2SUM.008.MCF	Summary MCF file template needed for metadata (,/MCF/)	Static Input	7232
TL2TNS	TL2TNS.008.MCF	Atmospheric temperature nadir MCF file template needed for metadata . (./MCF/)	Static Input	7232
TL2SUP	TL2SUP.008.MCF	Supplemental MCF file template needed for metadata (./MCF)	Static Input	7232
TL2TLS	TL2TLS.008.MCF	Atmospheric temperature limb MCF file template needed for metadata. (./MCF/)	Static Input	7232
TL2CH4NS	TL2CH4NS.008.MCF	CH4 nadir MCF file template needed for metadata. (./MCF/)	Static Input	7232
TL2CH4LS	TL2CH4LS.008.MCF	CH4 limb MCF file template needed for metadata. (./MCF/)	Static Input	7232
TL2CONS	TL2CONS.008.MCF	CO nadir MCF file template needed for metadata. (./MCF/)	Static Input	7232
TL2COLS	TL2COLS.008.MCF	CO limb MCF file template needed for metadata. (./MCF/)	Static Input	7232
TL2H2ONS	TL2H2ONS.008.MCF	H2O nadir MCF file template needed for metadata. (./MCF/)	Static Input	7232
TL2H2OLS	TL2H2OLS.008.MCF	H2O limb MCF file template needed for metadata. (./MCF/)	Static Input	7232
TL2HNO3S	TL2HNO3S.008.MCF	HNO3 limb MCF file template needed for metadata. (./MCF/)	Static Input	7232
TL2NO2S	TL2NO2S.008.MCF	NO2 limb MCF file template needed for metadata. (./MCF/)	Static Input	7232
TL2O3NS	TL2O3NS.008.MCF	O3 nadir MCF file template needed for metadata. (./MCF/)	Static Input	7232
TL2O3LS	TL2O3LS.008.MCF	O3 limb MCF file template needed for metadata. (./MCF/)	Static Input	7232
TL2HDONS	TL2HDONS.008.MCF	HDO nadir MCF file template needed for metadata. (./MCF/)	Static Input	7232
TL2HDOLS	TL2HDOLS.008.MCF	HDO limb MCF file template needed for metadata. (./MCF/)	Static Input	7232

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TL2ANCS	TL2ANCS.008.MCF	Ancillary MCF file template needed for metadata. (./MCF/)	Static Input	7232
TL2SUMS	TL2SUMS.008.MCF	Summary MCF file template needed for metadata (,/MCF/)	Static Input	7232
TL2SUPS	TL2SUPS.008.MCF	Supplemental MCF file template needed for metadata (./MCF)	Static Input	7232
TL2CO2N	TL2CO2N.008.MCF	CO2 nadir MCF file template needed for metadata. (./MCF/)	Static Input	7232
TL2CO2NS	TL2CO2NS.008.MCF	CO2 nadir MCF File template needed for meatadata (./MCF/)	Static Input	7233
TL2NH3N	TL2NH3N.008.MCF	NH3 nadir MCF File template needed for meatadata (./MCF/)	Static Input	7232
TL2NH3NS	TL2NH3NS.008.MCF	NH3 nadir MCF File template needed for meatadata (./MCF/)	Static Input	7233
TL2CO2LN	TL2CO2LN.008.MCF	CO2 Lite nadir MCF file template needed for metadata. (./MCF/)	Static Input	7233
TL2ATMTN	TES-Aura_L2-ATM-TEMP-Nadir_r<RunId>_Fff_cc.he5.met*	TES/Aura Level 2 Atmospheric Temperatures Nadir HDF .met file.	Output	5846
TL2ATMTL	TES-Aura_L2-ATM-TEMP-Limb_r<RunId>_Fff_cc.he5.met*	TES/Aura Level 2 Atmospheric Temperatures Limb met file.	Output	5845
TL2CH4N	TES-Aura_L2-CH4-Nadir_r<RunId>_Fff_cc.he5.met*	TES/Aura Level 2 CH4 Nadir HDF .met file.	Output	5840
TL2CON	TES-Aura_L2-CO-Nadir_r<RunId>_Fff_cc.he5.met*	TES/Aura Level 2 CO Nadir HDF .met file.	Output	5838
TL2H2ON	TES-Aura_L2-H2O-Nadir_r<RunId>_Fff_cc.he5.met*	TES/Aura Level 2 H2O Nadir HDF .met file.	Output	5840
TL2H2OL	TES-Aura_L2-H2O-Limb_r<RunId>_Fff_cc.he5.met*	TES/Aura Level 2 H2O Limb HDF .met file.	Output	5839
TL2HNO3L	TES-Aura_L2-HNO3-Limb_r<RunId>_Fff_cc.he5.met*	TES/Aura Level 2 HNO3 Limb HDF .met file.	Output	5841
TL2O3N	TES-Aura_L2-O3-Nadir_r<RunId>_Fff_cc.he5.met*	TES/Aura Level 2 O3 Nadir HDF .met file.	Output	5838
TL2O3L	TES-Aura_L2-O3-Limb_r<RunId>_Fff_cc.he5.met*	TES/Aura Level 2 O3 Limb HDF .met file.	Output	5837
TL2HDON	TES-Aura_L2-HDO-Nadir_r<RunId>_Fff_cc.he5.met*	TES/Aura Level 2 HDO Nadir HDF .met file.	Output	5840
TL2HDOL	TES-Aura_L2-HDO-Limb_r<RunId>_Fff_cc.he5.met*	TES/Aura Level 2 HDO Limb HDF .met file.	Output	5839
TL2ANC	TES-Aura_L2-ANC_r<RunId>_Fff_cc.he5.met*	TES/Aura Level 2 Ancillary HDF .met file.	Output	5839

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TL2SUM	TES-Aura_L2-SUMMARY-r<RunId>_Fff_cc.he5.met*	TES/Aura Level 2 Summary HDF met file	Output	5837
TL2SUP	TES-Aura_L2-SUPPLEMENTAL-r<RunId>_Fff_cc.he5.met*	TES/Aura Level 2 Supplemental HDF met file	Output	5842
TL2TNS	TES-Aura_L2-ATM-TEMP-SO-Nadir_r<RunId>_Fff_cc.he5.met*	TES/Aura Level 2 Atmospheric Temperatures Nadir Special Observation HDF .met file.	Output	5843
TL2TLS	TES-Aura_L2-ATM-TEMP-SO-Limb_r<RunId>_Fff_cc.he5.met*	TES/Aura Level 2 Atmospheric Temperatures Limb Special Observation met file.	Output	5843
TL2CH4NS	TES-Aura_L2-CH4-SO-Nadir_r<RunId>_Fff_cc.he5.met*	TES/Aura Level 2 CH4 Nadir Special Observation HDF .met file.	Output	5844
TL2CH4LS	TES-Aura_L2-CH4-SO-Limb_r<RunId>_Fff_cc.he5.met*	TES/Aura Level 2 CH4 Limb Special Observation HDF .met file.	Output	5844
TL2CONS	TES-Aura_L2-CO-SO-Nadir_r<RunId>_Fff_cc.he5.met*	TES/Aura Level 2 CO Nadir Special Observation HDF .met file.	Output	5842
TL2COLS	TES-Aura_L2-CO-SO-Limb_r<RunId>_Fff_cc.he5.met*	TES/Aura Level 2 CO Special Observation Limb HDF .met file.	Output	5841
TL2H2ONS	TES-Aura_L2-H2O-SO-Nadir_r<RunId>_Fff_cc.he5.met*	TES/Aura Level 2 H2O Nadir Special Observation HDF met file.	Output	5844
TL2H2OLS	TES-Aura_L2-H2O-SO-Limb_r<RunId>_Fff_cc.he5.met*	TES/Aura Level 2 H2O Limb Special Observation HDF met file.	Output	5843
TL2HNO3S	TES-Aura_L2-HNO3-SO-Limb_r<RunId>_Fff_cc.he5.met*	TES/Aura Level 2 HNO3 Limb Special Observation HDF met file.	Output	5845
TL2NO2S	TES-Aura_L2-NO2-SO-Limb_r<RunId>_Fff_cc.he5.met*	TES/Aura Level 2 NO2 Limb Special Observation HDF met file.	Output	5843
TL2O3NS	TES-Aura_L2-O3-SO-Nadir_r<RunId>_Fff_cc.he5.met*	TES/Aura Level 2 O3 Nadir Special Observation HDF met file.	Output	5842
TL2O3LS	TES-Aura_L2-O3-SO-Limb_r<RunId>_Fff_cc.he5.met*	TES/Aura Level 2 O3 Limb Special Observation HDF met file.	Output	5841
TL2HDONS	TES-Aura_L2-HDO-SO-Nadir_r<RunId>_Fff_cc.he5.met*	TES/Aura Level 2 HDO Nadir Special Observation HDF .met file.	Output	5844
TL2HDOLS	TES-Aura_L2-HDO-SO-Limb_r<RunId>_Fff_cc.he5.met*	TES/Aura Level 2 HDO Limb Special Observation HDF .met file.	Output	5844
TL2O18NS	TES-Aura_L2-H2O18-SO-Nadir_r<RunId>_Fff_cc.he5.met	TES/Aura Level 2 $H2O^{18}$ Nadir Special Observation HDF met file.	Output	
TL2ANCS	TES-Aura_L2-SO-ANC_r<RunId>_Fff_cc.he5.met*	TES/Aura Level 2 Ancillary Special Observatio HDF met file.	Output	5843
TL2SUMS	TES-Aura_L2-SUMMARY-SO-r<RunId>_Fff_cc.he5.met*	TES/Aura Level 2 Summary Special Observation HDF met file	Output	5841
TL2SUPS	TES-Aura_L2-SUPPLEMENTAL-SO-r<RunId>_Fff_cc.he5*	TES/Aura Level 2 Supplemental Speical Observation HDF file	Output	5846

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TL2CO2N	TES-Aura_L2-CO2-Nadir_r<RunId>_Fff_cc.he5.met*	TES/Aura Level 2 CO2 Nadir HDF .met file.	Output	5788
TL2CO2NS	TES-Aura_L2-CO2-SO-Limb_r<RunId>_Fff_cc.he5.met*	TES/Aura Level 2 CO2 Special Observation Limb HDF .met file.	Output	5789
TL2NH3N	TES-Aura_L2-NH3-Nadir_r<RunId>_Fff_cc.he5.met*	TES/Aura Level 2 NH3 Nadir HDF .met file.	Output	5788
TL2NH3NS	TES-Aura_L2-NH3-SO-Limb_r<RunId>_Fff_cc.he5.met*	TES/Aura Level 2 NH3 Special Observation Limb HDF .met file.	Output	5789
TL2CO2LN	TES-Aura_L2-CO2L-Nadir_<year>m<month>_Fff_cc.he5.met*	TES/Aura Level 2 CO2 Lite Nadir Monthly Reduced Grid Observation HDF .met file.	Output	5788
TL2ANC	TES-Aura_L2-ANC_r<RunId>_Fff_cc.he5*	TES/Aura Level 2 Ancillary HDF product file.	Output	
TL2ATMTN	TES-Aura_L2-ATM-TEMP-Nadir_r<RunId>_Fff_cc.he5*	TES/Aura Level 2 Atmospheric Temperatures Nadir HDF file.	Output	
TL2ATMTL	TES-Aura_L2-ATM-TEMP-Limb_r<RunId>_Fff_cc.he5*	TES/Aura Level 2 Atmospheric Temperatures Limb file.	Output	
TL2CH4N	TES-Aura_L2-CH4-Nadir_r<RunId>_Fff_cc.he5*	TES/Aura Level 2 CH4 Nadir HDF file.	Output	
TL2CH4L	TES-Aura_L2-CH4-Limb_r<RunId>_Fff_cc.he5*	TES/Aura Level 2 CH4 Limb HDF file.	Output	
TL2CON	TES-Aura_L2-CO-Nadir_r<RunId>_Fff_cc.he5*	TES/Aura Level 2 CO Nadir HDF file.	Output	
TL2COL	TES-Aura_L2-CO-Limb_r<RunId>_Fff_cc.he5*	TES/Aura Level 2 CO Limb HDF file.	Output	
TL2H2ON	TES-Aura_L2-H2O-Nadir_r<RunId>_Fff_cc.he5*	TES/Aura Level 2 H2O Nadir HDF file.	Output	
TL2H2OL	TES-Aura_L2-H2O-Limb_r<RunId>_Fff_cc.he5*	TES/Aura Level 2 H2O Limb HDF file.	Output	
TL2HNO3L	TES-Aura_L2-HNO3-Limb_r<RunId>_Fff_cc.he5*	TES/Aura Level 2 HNO3 Limb HDF file.	Output	
TL2NO2L	TES-Aura_L2-NO2-Limb_r<RunId>_Fff_cc.he5*	TES/Aura Level 2 NO2 Limb HDF file.	Output	
TL2O3N	TES-Aura_L2-O3-Nadir_r<RunId>_Fff_cc.he5*	TES/Aura Level 2 O3 Nadir HDF file.	Output	
TL2O3L	TES-Aura_L2-O3-Limb_r<RunId>_Fff_cc.he5*	TES/Aura Level 2 O3 Limb HDF file.	Output	
TL2HDON	TES-Aura_L2-HDO-Nadir_r<RunId>_Fff_cc.he5*	TES/Aura Level 2 HDO Nadir HDF file.	Output	

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TL2HDOL	TES-Aura_L2-HDO-Limb_r<RunId>_Fff_cc.he5*	TES/Aura Level 2 HDO Limb HDF file.	Output	
TL2SUM	TES-Aura_L2-SUMMARY-r<RunId>_Fff_cc.he5*	TES/Aura Level 2 Summary HDF file	Output	
TL2ANCS	TES-Aura_L2-SO-ANC_r<RunId>_Fff_cc.he5*	TES/Aura Level 2 Ancillary Special Observatio HDF file.	Output	
TL2TNS	TES-Aura_L2-ATM-TEMP-SO-Nadir_r<RunId>_Fff_cc.he5*	TES/Aura Level 2 Atmospheric Temperatures Nadir Special Observation HDF file.	Output	
TL2TLS	TES-Aura_L2-ATM-TEMP-SO-Limb_r<RunId>_Fff_cc.he5*	TES/Aura Level 2 Atmospheric Temperatures Limb Special Observation file.	Output	
TL2CH4NS	TES-Aura_L2-CH4-SO-Nadir_r<RunId>_Fff_cc.he5*	TES/Aura Level 2 CH4 Nadir Special Observation HDF file.	Output	
TL2CH4LS	TES-Aura_L2-CH4-SO-Limb_r<RunId>_Fff_cc.he5*	TES/Aura Level 2 CH4 Limb Special Observation HDF file.	Output	
TL2CONS	TES-Aura_L2-CO-SO-Nadir_r<RunId>_Fff_cc.he5*	TES/Aura Level 2 CO Nadir Special Observation HDF file.	Output	
TL2COLS	TES-Aura_L2-CO-SO-Limb_r<RunId>_Fff_cc.he5*	TES/Aura Level 2 CO Special Observation Limb HDF file.	Output	
TL2H2ONS	TES-Aura_L2-H2O-SO-Nadir_r<RunId>_Fff_cc.he5*	TES/Aura Level 2 H2O Nadir Special Observation HDF file.	Output	
TL2H2OLS	TES-Aura_L2-H2O-SO-Limb_r<RunId>_Fff_cc.he5*	TES/Aura Level 2 H2O Limb Special Observation HDF file.	Output	
TL2HNO3S	TES-Aura_L2-HNO3-SO-Limb_r<RunId>_Fff_cc.he5*	TES/Aura Level 2 HNO3 Limb Special Observation HDF file.	Output	
TL2NO2S	TES-Aura_L2-NO2-SO-Limb_r<RunId>_Fff_cc.he5*	TES/Aura Level 2 NO2 Limb Special Observation HDF file.	Output	
TL2O3NS	TES-Aura_L2-O3-SO-Nadir_r<RunId>_Fff_cc.he5*	TES/Aura Level 2 O3 Nadir Special Observation HDF file.	Output	
TL2O3LS	TES-Aura_L2-O3-SO-Limb_r<RunId>_Fff_cc.he5*	TES/Aura Level 2 O3 Limb Special Observation HDF file.	Output	
TL2HDONS	TES-Aura_L2-HDO-SO-Nadir_r<RunId>_Fff_cc.he5*	TES/Aura Level 2 HDO Nadir Special Observation HDF file.	Output	
TL2HDOLS	TES-Aura_L2-HDO-SO-Limb_r<RunId>_Fff_cc.he5*	TES/Aura Level 2 HDO Limb Special Observation HDF file.	Output	
TL2SUMS	TES-Aura_L2-SUMMARY-SO-r<RunId>_Fff_cc.he5*	TES/Aura Level 2 Summary Special Observation HDF file	Output	
TL2SUPS	TES-Aura_L2-SUPPLEMENTAL-SO- r<RunId>_Fff_cc.he5*	TES/Aura Level 2 Supplemental Special Observation HDF file	Output	
TL2CO2N	TES-Aura_L2-CO2-Nadir_r<RunId>_Fff_cc.he5*	TES/Aura Level 2 CO2 Nadir HDF file.	Output	

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TL2CO2NS	TES-Aura_L2-CO2-SO-Limb_r<RunId>_Fff_cc.he5*	TES/Aura Level 2 CO2 Special Observation Limb HDF file.	Output	
TL2NH3N	TES-Aura_L2-NH3-Nadir_r<RunId>_Fff_cc.he5*	TES/Aura Level 2 NH3 Nadir HDF file.	Output	
TL2NH3NS	TES-Aura_L2-NH3-SO-Limb_r<RunId>_Fff_cc.he5*	TES/Aura Level 2 NH3 Special Observation Limb HDF file.	Output	
TL2CO2LN	TES-Aura_L2-CO2L-Nadir_<year>m<month>_Fff_cc.he5*	TES/Aura Level 2 CO2 Lite Nadir Monthly Reduced Grid Observation HDF file.	Output	
N/A	L2_Products_r<RunId>.log	A log file generated for every PGE invocation.	Output	
N/A	L2_Products_r<RunId>_error_file.dat	Optional error file produced if errors occur. This file is always sent to the SCF. The path is set by the environment variable FWErrorFile.	Output	
TL2ATMTN	TES-Aura_L2-ATM-TEMP-Nadir_r<RunId>_C01_Fff_cc.he5.met*	TES/Aura Level 2 Atmospheric Temperatures Nadir HDF .met file.	Output	5846
TL2ATMTL	TES-Aura_L2-ATM-TEMP-Limb_r<RunId>_C01_Fff_cc.he5.met*	TES/Aura Level 2 Atmospheric Temperatures Limb met file.	Output	5845
TL2CH4N	TES-Aura_L2-CH4-Nadir_r<RunId>_C01_Fff_cc.he5.met*	TES/Aura Level 2 CH4 Nadir HDF .met file.	Output	5840
TL2CON	TES-Aura_L2-CO-Nadir_r<RunId>_C01_Fff_cc.he5.met*	TES/Aura Level 2 CO Nadir HDF .met file.	Output	5838
TL2H2ON	TES-Aura_L2-H2O-Nadir_r<RunId>_C01_Fff_cc.he5.met*	TES/Aura Level 2 H2O Nadir HDF .met file.	Output	5840
TL2H2OL	TES-Aura_L2-H2O-Limb_r<RunId>_C01_Fff_cc.he5.met*	TES/Aura Level 2 H2O Limb HDF .met file.	Output	5839
TL2HNO3L	TES-Aura_L2-HNO3-Limb_r<RunId>_C01_Fff_cc.he5.met*	TES/Aura Level 2 HNO3 Limb HDF .met file.	Output	5841
TL2O3N	TES-Aura_L2-O3-Nadir_r<RunId>_C01_Fff_cc.he5.met*	TES/Aura Level 2 O3 Nadir HDF .met file.	Output	5838
TL2O3L	TES-Aura_L2-O3-Limb_r<RunId>_C01_Fff_cc.he5.met*	TES/Aura Level 2 O3 Limb HDF .met file.	Output	5837

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TL2HDON	TES-Aura_L2-HDO-Nadir_r<RunId>_C01_Fff_cc.he5.met*	TES/Aura Level 2 HDO Nadir HDF .met file.	Output	5840
TL2HDOL	TES-Aura_L2-HDO-Limb_r<RunId>_C01_Fff_cc.he5.met*	TES/Aura Level 2 HDO Limb HDF .met file.	Output	5839
TL2ANC	TES-Aura_L2-ANC_r<RunId>_C01_Fff_cc.he5.met*	TES/Aura Level 2 Ancillary HDF .met file.	Output	5839
TL2SUM	TES-Aura_L2-SUMMARY-r<RunId>_C01_Fff_cc.he5.met*	TES/Aura Level 2 Summary HDF met file	Output	5837
TL2SUP	TES-Aura_L2-SUPPLEMENTAL-r<RunId>_C01_Fff_cc.he5.met*	TES/Aura Level 2 Supplemental HDF met file	Output	5842
TL2TNS	TES-Aura_L2-ATM-TEMP-SO-Nadir_r<RunId>_C01_Fff_cc.he5.met*	TES/Aura Level 2 Atmospheric Temperatures Nadir Special Observation HDF .met file.	Output	5843
TL2TLS	TES-Aura_L2-ATM-TEMP-SO-Limb_r<RunId>_C01_Fff_cc.he5.met*	TES/Aura Level 2 Atmospheric Temperatures Limb Special Observation met file.	Output	5843
TL2CH4NS	TES-Aura_L2-CH4-SO-Nadir_r<RunId>_C01_Fff_cc.he5.met*	TES/Aura Level 2 CH4 Nadir Special Observation HDF .met file.	Output	5844
TL2CH4LS	TES-Aura_L2-CH4-SO-Limb_r<RunId>_C01_Fff_cc.he5.met*	TES/Aura Level 2 CH4 Limb Special Observation HDF .met file.	Output	5844
TL2CONS	TES-Aura_L2-CO-SO-Nadir_r<RunId>_C01_Fff_cc.he5.met*	TES/Aura Level 2 CO Nadir Special Observation HDF .met file.	Output	5842
TL2COLS	TES-Aura_L2-CO-SO-Limb_r<RunId>_C01_Fff_cc.he5.met*	TES/Aura Level 2 CO Special Observation Limb HDF .met file.	Output	5841
TL2H2ONS	TES-Aura_L2-H2O-SO-Nadir_r<RunId>_C01_Fff_cc.he5.met*	TES/Aura Level 2 H2O Nadir Special Observation HDF met file.	Output	5844
TL2H2OLS	TES-Aura_L2-H2O-SO-Limb_r<RunId>_C01_Fff_cc.he5.met*	TES/Aura Level 2 H2O Limb Special Observation HDF met file.	Output	5843
TL2HNO3S	TES-Aura_L2-HNO3-SO-Limb_r<RunId>_C01_Fff_cc.he5.met*	TES/Aura Level 2 HNO3 Limb Special Observation HDF met file.	Output	5845

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TL2NO2S	TES-Aura_L2-NO2-SO-Limb_r<RunId>_C01_Fff_cc.he5.met*	TES/Aura Level 2 NO2 Limb Special Observation HDF met file.	Output	5843
TL2O3NS	TES-Aura_L2-O3-SO-Nadir_r<RunId>_C01_Fff_cc.he5.met*	TES/Aura Level 2 O3 Nadir Special Observation HDF met file.	Output	5842
TL2O3LS	TES-Aura_L2-O3-SO-Limb_r<RunId>_C01_Fff_cc.he5.met*	TES/Aura Level 2 O3 Limb Special Observation HDF met file.	Output	5841
TL2HDONS	TES-Aura_L2-HDO-SO-Nadir_r<RunId>_C01_Fff_cc.he5.met*	TES/Aura Level 2 HDO Nadir Special Observation HDF .met file.	Output	5844
TL2HDOLS	TES-Aura_L2-HDO-SO-Limb_r<RunId>_C01_Fff_cc.he5.met*	TES/Aura Level 2 HDO Limb Special Observation HDF .met file.	Output	5844
TL2O18NS	TES-Aura_L2-H2O18-SO-Nadir_r<RunId>_C01_Fff_cc.he5.met	TES/Aura Level 2 $H2O^{18}$ Nadir Special Observation HDF met file.	Output	
TL2ANCS	TES-Aura_L2-SO-ANC_r<RunId>_C01_Fff_cc.he5.met*	TES/Aura Level 2 Ancillary Special Observation HDF met file.	Output	5843
TL2SUMS	TES-Aura_L2-SUMMARY-SO-r<RunId>_C01_Fff_cc.he5.met*	TES/Aura Level 2 Summary Special Observation HDF met file	Output	5841
TL2SUPS	TES-Aura_L2-SUPPLEMENTAL-SO-r<RunId>_C01_Fff_cc.he5*	TES/Aura Level 2 Supplemental Speical Observation HDF file	Output	5846
TL2CO2N	TES-Aura_L2-CO2-Nadir_r<RunId>_C01_Fff_cc.he5.met*	TES/Aura Level 2 CO2 Nadir HDF .met file.	Output	5788
TL2CO2NS	TES-Aura_L2-CO2-SO-Limb_r<RunId>_C01_Fff_cc.he5.met*	TES/Aura Level 2 CO2 Special Observation Limb HDF .met file.	Output	5789
TL2NH3N	TES-Aura_L2-NH3-Nadir_r<RunId>_C01_Fff_cc.he5.met*	TES/Aura Level 2 NH3 Nadir HDF .met file.	Output	5788
TL2NH3NS	TES-Aura_L2-NH3-SO-Limb_r<RunId>_C01_Fff_cc.he5.met*	TES/Aura Level 2 NH3 Special Observation Limb HDF .met file.	Output	5789
TL2CO2LN	TES-Aura_L2-CO2L-Nadir_<year>m<month>_C01_Fff_cc.he5.met*	TES/Aura Level 2 CO2 Lite Nadir Monthly Reduced Grid Observation HDF .met file.	Output	5788
TL2ANC	TES-Aura_L2-	TES/Aura Level 2 Ancillary HDF product	Output	

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	ANC_r<RunId>_C01_Fff_cc.he5*	file.		
TL2ATMTN	TES-Aura_L2-ATM-TEMP-Nadir_r<RunId>_C01_Fff_cc.he5*	TES/Aura Level 2 Atmospheric Temperatures Nadir HDF file.	Output	
TL2ATMTL	TES-Aura_L2-ATM-TEMP-Limb_r<RunId>_C01_Fff_cc.he5*	TES/Aura Level 2 Atmospheric Temperatures Limb file.	Output	
TL2CH4N	TES-Aura_L2-CH4-Nadir_r<RunId>_C01_Fff_cc.he5*	TES/Aura Level 2 CH4 Nadir HDF file.	Output	
TL2CH4L	TES-Aura_L2-CH4-Limb_r<RunId>_C01_Fff_cc.he5*	TES/Aura Level 2 CH4 Limb HDF file.	Output	
TL2CON	TES-Aura_L2-CO-Nadir_r<RunId>_C01_Fff_cc.he5*	TES/Aura Level 2 CO Nadir HDF file.	Output	
TL2COL	TES-Aura_L2-CO-Limb_r<RunId>_C01_Fff_cc.he5*	TES/Aura Level 2 CO Limb HDF file.	Output	
TL2H2ON	TES-Aura_L2-H2O-Nadir_r<RunId>_C01_Fff_cc.he5*	TES/Aura Level 2 H2O Nadir HDF file.	Output	
TL2H2OL	TES-Aura_L2-H2O-Limb_r<RunId>_C01_Fff_cc.he5*	TES/Aura Level 2 H2O Limb HDF file.	Output	
TL2HNO3L	TES-Aura_L2-HNO3-Limb_r<RunId>_C01_Fff_cc.he5*	TES/Aura Level 2 HNO3 Limb HDF file.	Output	
TL2NO2L	TES-Aura_L2-NO2-Limb_r<RunId>_C01_Fff_cc.he5*	TES/Aura Level 2 NO2 Limb HDF file.	Output	
TL2O3N	TES-Aura_L2-O3-Nadir_r<RunId>_C01_Fff_cc.he5*	TES/Aura Level 2 O3 Nadir HDF file.	Output	
TL2O3L	TES-Aura_L2-O3-Limb_r<RunId>_C01_Fff_cc.he5*	TES/Aura Level 2 O3 Limb HDF file.	Output	
TL2HDON	TES-Aura_L2-HDO-Nadir_r<RunId>_C01_Fff_cc.he5*	TES/Aura Level 2 HDO Nadir HDF file.	Output	
TL2HDOL	TES-Aura_L2-HDO-Limb_r<RunId>_C01_Fff_cc.he5*	TES/Aura Level 2 HDO Limb HDF file.	Output	
TL2SUM	TES-Aura_L2-SUMMARY-r<RunId>_C01_Fff_cc.he5*	TES/Aura Level 2 Summary HDF file	Output	
TL2ANCS	TES-Aura_L2-SO-ANC_r<RunId>_C01_Fff_cc.he5*	TES/Aura Level 2 Ancillary Special Observation HDF file.	Output	
TL2TNS	TES-Aura_L2-ATM-TEMP-SO-Nadir_r<RunId>_C01_Fff_cc.he5*	TES/Aura Level 2 Atmospheric Temperatures Nadir Special Observation HDF file.	Output	
TL2TLS	TES-Aura_L2-ATM-TEMP-SO-Limb_r<RunId>_C01_Fff_cc.he5*	TES/Aura Level 2 Atmospheric Temperatures Limb Special Observation file.	Output	
TL2CH4NS	TES-Aura_L2-CH4-SO-Nadir_r<RunId>_C01_Fff_cc.he5*	TES/Aura Level 2 CH4 Nadir Special Observation HDF file.	Output	
TL2CH4LS	TES-Aura_L2-CH4-SO-	TES/Aura Level 2 CH4 Limb Special	Output	

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	Limb_r<RunId>_C01_Fff_cc.he5*	Observation HDF file.		
TL2CONS	TES-Aura_L2-CO-SO-Nadir_r<RunId>_C01_Fff_cc.he5*	TES/Aura Level 2 CO Nadir Special Observation HDF file.	Output	
TL2COLS	TES-Aura_L2-CO-SO-Limb_r<RunId>_C01_Fff_cc.he5*	TES/Aura Level 2 CO Special Observation Limb HDF file.	Output	
TL2H2ONS	TES-Aura_L2-H2O-SO-Nadir_r<RunId>_C01_Fff_cc.he5*	TES/Aura Level 2 H2O Nadir Special Observation HDF file.	Output	
TL2H2OLS	TES-Aura_L2-H2O-SO-Limb_r<RunId>_C01_Fff_cc.he5*	TES/Aura Level 2 H2O Limb Special Observation HDF file.	Output	
TL2HNO3S	TES-Aura_L2-HNO3-SO-Limb_r<RunId>_C01_Fff_cc.he5*	TES/Aura Level 2 HNO3 Limb Special Observation HDF file.	Output	
TL2NO2S	TES-Aura_L2-NO2-SO-Limb_r<RunId>_C01_Fff_cc.he5*	TES/Aura Level 2 NO2 Limb Special Observation HDF file.	Output	
TL2O3NS	TES-Aura_L2-O3-SO-Nadir_r<RunId>_C01_Fff_cc.he5*	TES/Aura Level 2 O3 Nadir Special Observation HDF file.	Output	
TL2O3LS	TES-Aura_L2-O3-SO-Limb_r<RunId>_C01_Fff_cc.he5*	TES/Aura Level 2 O3 Limb Special Observation HDF file.	Output	
TL2HDONS	TES-Aura_L2-HDO-SO-Nadir_r<RunId>_C01_Fff_cc.he5*	TES/Aura Level 2 HDO Nadir Special Observation HDF file.	Output	
TL2HDOLS	TES-Aura_L2-HDO-SO-Limb_r<RunId>_C01_Fff_cc.he5*	TES/Aura Level 2 HDO Limb Special Observation HDF file.	Output	
TL2SUMS	TES-Aura_L2-SUMMARY-SO-r<RunId>_C01_Fff_cc.he5*	TES/Aura Level 2 Summary Special Observation HDF file	Output	
TL2SUPS	TES-Aura_L2-SUPPLEMENTAL-SO- r<RunId>_C01_Fff_cc.he5*	TES/Aura Level 2 Supplemental Special Observation HDF file	Output	
TL2CO2N	TES-Aura_L2-CO2-Nadir_r<RunId>_C01_Fff_cc.he5*	TES/Aura Level 2 CO2 Nadir HDF file.	Output	
TL2CO2NS	TES-Aura_L2-CO2-SO-Limb_r<RunId>_C01_Fff_cc.he5*	TES/Aura Level 2 CO2 Special Observation Limb HDF file.	Output	
TL2NH3N	TES-Aura_L2-NH3-Nadir_r<RunId>_C01_Fff_cc.he5*	TES/Aura Level 2 NH3 Nadir HDF file.	Output	
TL2NH3NS	TES-Aura_L2-NH3-SO-Limb_r<RunId>_C01_Fff_cc.he5*	TES/Aura Level 2 NH3 Special Observation Limb HDF file.	Output	
TL2CO2LN	TES-Aura_L2-CO2L-Nadir_<year>m<month>_C01_Fff_cc.he5*	TES/Aura Level 2 CO2 Lite Nadir Monthly Reduced Grid Observation HDF file.	Output	
N/A	L2_Products_r<RunId>.log	A log file generated for every PGE invocation.	Output	
N/A	L2_Products_r<RunId>_error_file.dat	Optional error file produced if errors occur. This file is always sent to the SCF. The path is set by the environment variable FWErrorFile.	Output	

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* - Note: Standard Product ff = 06, cc = 08; Summary Product ff = 03, cc =08; Supplemental Product ff = 02, cc =08. CO2 Lite Product ff = 01, cc = 08These parameters are controlled through the Framework run parameters or from command line.

Note: after the L2 Products PGE is netCDF augmented it will contain three new attributes in the Swath groups, nFreq, nLevels, nTimes

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2.2.2.2 Files to be sent to the DAAC

As part of normal processing, all ESDT files and their associated .met files are to be archived to the DAAC as part of SIPS standard processing. There is one complete set of 22 ESDTs and associated .met files for each global survey processed.

If processing in Special Observations (SO) mode, the number of ESDT's sent to the DAAC can vary due to the species retrieved.

2.2.2.3 Files to be sent to the SCF

Failed PGE packages should be sent to the SCF by SIPS. SIPS should include workspace contents for L2_Products.

2.2.3 Database

The Oracle database is the primary data source for L2_Products.

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2.2.3.2 Database Tables Attributes

Several database tables are used during the execution of L2_Products. Summary information is provided below: For more detailed information about the database tables see the TES Ground Data System Database Definition, JPL D-23034 document.

Table 3

Table Name	Description	Read/ Write/ Update*	Shared-Use Information		
			Inter-PGE	Inter-Subsys	Apps/ SIPS
Scan_Attributes	Provides a map from run, sequence, scan to scene ID.	R	Y (L1)	Y (L1)	
L2_Scene	Provides a map from target observations to the L2_Scene_ID	R	Y (L2)		
L2_Species_Data	Contains retrieval results.	R	Y (L2)		
L2_Nadir_Geolocation	Contains the Geolocation data for Nadir.	R	Y (L2)		
L2_Associated_Scene	Contains additional data that is applicable to both Nadir and Limb	R	Y (L2)		
L2_Associated_Scene_Species	Contains additional data per target scene per species for both Nadir and Limb	R	Y (L2)		
L2_Surface_Emissivity	Contains the surface emissivity for the Nadir Ancillary product	R	Y (L2)		
L1A_Engineering	Contains time & filter position information	R		Y(L1)	
L1A_Geolocation	Contains geolocation information for Limb retrievals	R		Y(L1)	
Run_Attributes	Contains the start & stop times used by L2_Products	R	Y (L2)	Y(L1)	
Emis_Parameters	Provides parameters that specify standardProductInfo	R	Y (L2)		
Strategy	Provides all information for running a retrieval	R	Y (L2)		
Std_Pressure_Lvls	Contains the standard pressure levels used in Retrieval processing	R	Y(L2)		
Species_State_Information	Provides list of species and sources	R	Y (L2)		
L2_Nonretrieved_Species	Provide the data for the non-retrieved species	R	Y (L2)		

* - R/W/U = Read/Write/Update

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Table Name:	**Scan_Attributes**
Populated By:	L1A Main
Purpose:	Provides translation between run/seq/scan to Scene_ID. Scene ID is used extensively in other tables.

Table Name:	**L2_Scene**
Populated By:	L2_Retrieval
Purpose:	Supporting L2 Retrieval to L2 Products interface; provides mapping from target observations to unique L2_Scene_ID. All L2 target observation will be entered into this table. Averaged nadir observation (i.e. two instrument observations that result in a single L2 target scene) are represented by two entries in this table; each entry will contain the same L2_Scene_ID but have different Scene_Ids. Limb observations will be one-to-one with instrument observations.

Table Name:	**L2_Species_Data**
Populated By:	L2_Retrieval
Purpose:	Supporting L2 Retrieval to L2 Products interface; Provides VMR per species and FM pressure level or target scenes

Table Name:	**L2_Nadir_Geolocation**
Populated By:	L2 Retrieval PGE
Purpose:	Supporting L2 Retrieval to L2 Products interface; provides averaged nadir geolocation data calculated by L2 - used by L2 Products PGE in creation of averaged Nadir data product

Table Name:	**L2_Associated_Scene**
Populated By:	L2 Retrieval PGE
Purpose:	Supporting L2 Retrieval to L2 Products interface; data that is per target scene for both nadir and limb.

Table Name:	**L2_Associated_Scene_Species**
Populated By:	L2 Retrieval PGE
Purpose:	Supporting L2 Retrieval to L2 Products interface; data that is per target scene per species for both nadir and limb.

Table Name:	**L2_Surface_Emissivity**
Populated By:	L2 Retrieval PGE
Purpose:	Supporting L2 Retrieval to L2 Products interface; For nadir only, provide Surface Emissivity

Table Name:	**L1A_Engineering**
Populated By:	L1A Main
Purpose:	Provides temperatures and other engineering attributes based on scan

Table Name:	**L1A_Geolocation**
Populated By:	L1A Geolocation PGE
Purpose:	Provides geolocation calculated by L1A – used by L1B Reformat PGE in creation of standard data product

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Table Name:	**Run_Attributes**
Populated By:	L1A Main
Purpose:	Provides attributes specific to an entire Run, a start/stop time for each instrument run processed
Table Name	**Emis_Parameters**
Created By:	Delivered with S/W
Purpose:	Provides parameters that specify standardProductInfo.s
Table Name	**Strategy_Table**
Created By:	Delivered with S/W
Purpose:	Provides all information for running a retrieval
Table Name	**Std_Pressure_Lvls Table**
Created By:	Delivered with S/W
Purpose:	Provides the standard pressure grid for full state vectors
Table Name	**Species_State_Information**
Created By:	Delivered with S/W
Purpose:	Provides list of species and their sources as well as other parameters in the state
Table Name	**L2_Nonretrieved_Species**
Created By:	L2_Retireval
Purpose:	Supporting L2_Retrieval to L2_Products interface; Provides VMR per species and FM pressure level for target scenes that are not retrieved.

2.3 PGE Execution

The L2 Products PGE is executed once per Global Survey or Special Observation at the completion of L2_Retrieval PGE. And once per month after completion of L2_Retrieval PGE for all GS and SO for that specific calendar month to generate the CO2 Lite standard output product.

Before running the PGE:

- The environment variables listed below in sect. 2.3.1.1 need to be set.
- The Parameter Definition file needs to reside in the top-level directory, or where the PGE will be executed from. Optionally, the Control_Parameter file may be used or the *Program_Control* may be supplied at the command line.
- The database needs to exist with the tables listed above and be populated.
- All inputs files listed in Table 2 above need to reside in the proper places, i.e., PCF/pcf_test.dat, MCF/TES.MCF, etc.

To execute the PGE, the command-line arguments are:

L2_Products_Main -deffile L2_Products_def.dat -paramfile L2_Products_param_20000.dat

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or, if not using the program_control file, the command line arguments would be:

L2_Products_Main -deffile L2_Products_def.dat -parameters 'Program_Control { run = 1999400023; FormatVersion = 06; ContentVersion = 08; SummFormatVersion = 03; SummContentVersion = 08; SuppFormatVersion = 02; SuppContentVersion = 08; }'

Note: *Version is the version identifier, (integer format, default is F01_00). Summ*Version refers to the version of the Summary Product files. If any of these variables are not provided at the command line, then the default specified in the L2_Products_def.dat file will be used.

To execute the PGE for CO2 Lite, the command-line arguments are:

L2_Products_Main -deffile L2_Products_def.dat -paramfile L2_Products_param_20000.dat

or, if not using the program_control file, the command line arguments would be:

L2_Products_Main -deffile L2_Products_def.dat -parameters 'Program_Control { RunMode = "Lite"; Month = "2009-12";LiteFormatVersion = 01; LiteContentVersion = 08; }'

Note: *Uses FormatVersion and ContentVersion only.

To augment the TES HDF-EOS files with netCDF scale dimensions execute netCDF augmentation script after the L2 Products has completed generation of the HDF-EOS standard products.

aug_eos5 "File_To_Augment.he5"

Note: The binary, aug_eos5, should be called to augment the HDF5 results of Level 2 processing once the entrie step is complete but before the data is off-loaded to archvial storage and before Level 3 processing begins. The necessitates that the source code be compiled and available in the system PATH environment variable. Example, /pkg/pgs/aug_eos5-2/bin/aug_eos5 or /pkg/pgs/aug_eos5-2_64/bin/aug_eos5.

2.3.1 Environment

2.3.1.1 Environment Variables

The environment variables that need to be set are:

1. Oracle Environments

   ORACLE_BASE

   ORACLE_HOME

   ORACLE_DOC

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ORACLE_PATH

NLS_LANGUAGE - AMERICAN

SID – <database>

ORACLE_SID – <database>

DB_USER – <user name>

DB_PWD - <password>

2. FW Environments

   FWErrorFile – Error log file, set to "./L2_Products_{RunId}.errorlog".

   ErrorCodeFile – Header file containing all error code, set to the full path to where "error_code.h" resides, i.e., Framework/Exception/error_code.h.

3. Other

   PGSHOME – set to the current location of the SDPTK, i.e., /pkg/pgs/TOOLKIT

   PGS_PC_INFO_FILE – set to the location of the toolkit PCF file. For L2_Products this resides in the PCF directory.

   LD_LIBRARY_PATH – (this path must include:$ORACLE_HOME & :$ORACLE_BASE & /pkg/lang/gcc-3.4.5/lib)

   L2_PRODUCT_INPUT_PATH - (path to where the L2_Retrieval binary file outputs are stored for given GS or SO or for all GS and SO for specified calendar month for CO2 Lite processing) For L2_Products testing, these files reside in: /vobs/L2_Products/test/in.

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2.3.1.2 Parameter Definition File

Parameter definition and control files are prepared according to the Framework Programmer's Guide. The parameter definition file will be provided to the SIPS and is listed below:

L2_Products_def.dat

```
Parameter_Control {

  LogfileName string 100 "./L2_Products.log"          // Log file name;
  VerboseMode radio  Verbose true Normal false Quiet false  // Log mode;
  TESMCFname  string 100 "./MCF/TES.MCF"        // TES MCF file name;
}

Program_Control {

  run                int      1          2000000000        1   // Run counter;
  RunMode        string     10          "Standard"          // Valid granule type - "Standard"
or "Lite";
  Month            string  200          ""         // One month  ex. "2006-10";
  Forced_Failure bool       false                    // I&T usage only;
  Limb1Scan   int    0  7  4            // Limb 1 Scan number;
  Limb2Scan   int    0  7  5            // Limb 2 Scan number;
  Limb3Scan   int    0  7  6            // Limb 3 Scan number;
  FormatVersion int  00  99 06           // Format Version;
  ContentVersion int 00  99 08           // Content Version;
  SummFormatVersion int 00 99 03          // Format Version for summary prod;
  SummContentVersion int 00 99 08         // Content Version for summary prod;
  SuppFormatVersion int 00 99 02         // Format Version for supplemental prod;
  SuppContentVersion int 00 99 08        // Content Version for supplemental prod;
  LiteFormatVersion int 00 99 01         // Format Version for CO2Lite prod;
  LiteContentVersion int 00 99 08        // Content Version for CO2Lite prod;
}

MCFLogicalID {
  TL2H2ON    int 0 100000   361    // TES Aura L2 H2O Nadir MCF logical ID;
  TL2O3N     int 0 100000   411    // TES Aura L2 O3 Nadir MCF logical ID;
  TL2CH4N    int 0 100000   321    // TES Aura L2 CH4 Nadir MCF logical ID;
  TL2CON     int 0 100000   341    // TES Aura L2 CO Nadir MCF logical ID;
  TL2ATMTN   int 0 100000   301    // TES Aura L2 ATMT Nadir MCF logical ID;
  TL2ANC     int 0 100000   431    // TES Aura L2 Ancillary MCF logical ID;
  TL2H2ONS   int 0 100000   521    // TES Aura L2 H2O Nadir MCF logical ID;
  TL2O3NS    int 0 100000   561    // TES Aura L2 O3 Nadir MCF logical ID;
  TL2CH4NS   int 0 100000   481    // TES Aura L2 CH4 Nadir MCF logical ID;
  TL2CONS    int 0 100000   501    // TES Aura L2 CO Nadir MCF logical ID;
  TL2NO2S    int 0 100000   541    // TES Aura L2 NO2 Limb MCF logical ID;
  TL2HNO3S   int 0 100000   531    // TES Aura L2 HNO3 Limb MCF logical ID;
  TL2TNS     int 0 100000   461    // TES Aura L2 ATMT Nadir MCF logical ID;
  TL2ANCS    int 0 100000   441    // TES Aura L2 Ancillary MCF logical ID;
  TL2SUM     int 0 100000   571    // TES Aura L2 Summary MCF logical ID;
  TL2SUMS    int 0 100000   621    // TES Aura L2 Summary MCF logical ID;
  TL2HDON    int 0 100000   581    // TES Aura L2 HDO Nadir MCF logical ID;
  TL2HDONS   int 0 100000   601    // TES Aura L2 HDO Nadir MCF logical ID;
  TL2SUP     int 0 100000   631    // TES Aura L2 Supplemental MCF logical ID;
```


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```
    TL2SUPS    int 0 100000   641    // TES Aura L2 Supplemental MCF logical ID;
    TL2CO2N    int 0 100000   661    // TES Aura L2 CO2 Nadir MCF logical ID;
    TL2CO2NS   int 0 100000   681    // TES Aura L2 CO2 Nadir MCF logical ID;
    TL2CO2LN   int 0 100000   731    // TES Aura L2 CO2 Lite MCF logical ID;
    TL2NH3N    int 0 100000   701    // TES Aura L2 NH3 Nadir MCF logical ID;
    TL2NH3NS   int 0 100000   721    // TES Aura L2 NH3 Nadir MCF logical ID;
    TL2N2ON    int 0 100000   741    // TES Aura L2 N2O Nadir MCF logical ID;
    TL2N2ONS   int 0 100000   771    // TES Aura L2 N2O Nadir MCF logical ID;
    TL2MTLN    int 0 100000   781    // TES Aura L2 Methanol Nadir MCF logical ID;
    TL2MTLNS   int 0 100000   791    // TES Aura L2 Methanol Nadir MCF logical ID;
    TL2FORN    int 0 100000   801    // TES Aura L2 Formic Acid Nadir MCF logical ID;
    TL2FORNS   int 0 100000   811    // TES Aura L2 Formic Acid Nadir MCF logical ID;
    TL2PANN    int 0 100000   821    // TES Aura L2 PAN Nadir MCF logical ID;
    TL2PANNS   int 0 100000   831    // TES Aura L2 PAN Nadir MCF logical ID;
    TL2OCSN    int 0 100000   841    // TES Aura L2 OCS Nadir MCF logical ID;
    TL2OCSNS   int 0 100000   851    // TES Aura L2 OCS Nadir MCF logical ID;
    TL2IRKN    int 0 100000   861    // TES Aura L2 IRK Nadir MCF logical ID;
    TL2IRKNS   int 0 100000   871    // TES Aura L2 IRK Nadir MCF logical ID;
    TL2HCNN    int 0 100000   881    // TES Aura L2 HCN Nadir MCF logical ID;
    TL2HCNNS   int 0 100000   891    // TES Aura L2 HCN Nadir MCF logical ID;
    TL2ACET    int 0 100000   901    // TES Aura L2 ACET Nadir MCF logical ID;
    TL2ACETS   int 0 100000   911    // TES Aura L2 ACET Nadir MCF logical ID;
  }
```

L2_PGE_control_param_<RunId>.dat (or the defaults may be used from the L2_Products_def.dat):

```
  Program_Control {

    run = 1999400023;
    Limb1Scan = 4;
    Limb2Scan = 5;
    Limb3Scan = 6;
    FormatVersion = 06;
    ContentVersion = 08;
    SummFormatVersion = 03;
    SummContentVersion = 08;
    SuppFormatVersion = 02;
    SuppContentVersion = 08;
    LiteFormatVersion = 01;
    LiteContentVersion = 08;
  }
```

For CO2 Lite processing L2_PGE_control_param_month.dat (or the defaults may be used from the L2_Products_def.dat):

```
  Program_Control {

    RunMode = "Lite";
    Month = "2009-12";
    LiteFormatVersion = 01;
    LiteContentVersion = 08;
  }
```


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2.3.1.3 Run-Time Parameters

Run-time parameters shall be specified by the SIPS as command line arguments. These include the Parameter Definition file (supplied to the SIPS by the subsystem) and the *Program_Control* value for *run*. See PGE Execution, section 2.3 of this document.

2.3.1.4 Triggering Conditions

In production, the L2_Products PGE is triggered upon completion of the last L2_Retrieval PGE for a global survey. SIPS is to inspect the Survey Retrieval Control Table for at least a configurable number of Nadir and Limb retrievals contributing to a global survey to trigger L2_Products. L2_Products PGE should be triggered once a month also for CO2 Lite after completion of L2_Retrieval PGE for all GS and SO runs for specified calendar month.

2.3.1.5 Completion Indication

L2 Products PGE will return 0 for successful completion and non-zero for failure. Success status should be returned only after the ESDT's are successfully generated.

If this PGE fails due to PGE error, no further L2 processing for this run is scheduled.

If this PGE fails due to SIPS error it needs to be restarted from the beginning of the run (at end of L2 Retrieval PGE). The L2_Products PGE cannot be restarted mid-run.

2.3.2 Processing Details

2.3.2.2 Processing Summary

1. Validate that input files are present, including TES MCF and ECS MCF. These files are listed in Table 2.

2. Generate a L2 Standard Product (.he5 & .met) for each species type listed above in table 1 and additionally the Ancillary and Summary product.

2.3.2.3 Expected Elapsed Time

TBD.

2.4 Resources

2.4.1 Number of CPUs

Only one CPU is required to perform operation of this PGE during the R12 timeframe.

2.4.2 Expected CPU Time

TBD.

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2.4.3 Expected Disk Usage

See Table 2 for approximate file sizes.

2.4.4 Database Usage

See TES Ground Data System Database Definition document.

3 Dependencies, Liens and Constraints

3.1 Dependencies and Liens

None.

3.2 Constraints

None.

4 Revision Summary

5 Acronyms

CM	Configuration Manager
CO2	Carbon Dioxide
ECS	EOS Core System
EOS	Earth Observing System
EOSDIS	EOS Data and Information System
HDF	Hierarchical Data Format
PGE	Product Generation Executive
SCF	Science Computing Facility
SDP	Science Data Processing
SDPS	Science Data Processing Software
SIS	Software Interface Specification
TES	Tropospheric Emission Spectrometer

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