

NOMENCLATURE FOR THE OSIRIS-REX RETURNED SAMPLE COLLECTION TO BE CURATED AT NASA JOHNSON SPACE CENTER.

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Introduction: The Origins, Spectral Interpretation, Resource Identification, Security-Regolith Explorer (OSIRIS-REx) spacecraft collected material from the asteroid Bennu on October 20, 2020 [1-2]. The OSIRIS-REx sample return capsule (SRC) is planned to return to Earth on September 24, 2023 [3].

Description of the Anticipated Collection: The OSIRIS-REx returned sample collection to be curated at NASA Johnson Space Center (JSC) will include both the returned asteroid material and returned flight hardware. It is anticipated that most of the mass of returned asteroid material will be inside of the touch-and-go sample acquisition mechanism (TAGSAM) head [3-4], and that this material will include a broad range of particles sizes from as large as a couple of centimeters across in their longest dimension to only micrometers across in their longest dimensions [5]. In addition, asteroid material may have been returned along with the flight hardware: intentionally by the contact pads or screens on the witness plates, serendipitously wedged into hardware items, or adhering to hardware items [3-5]. Thus, the returned flight hardware will also be part of the OSIRIS-REx returned sample collection. The nomenclature for this new astromaterials collection must include and accommodate the different types of samples within the collection.

Development of OSIRIS-REx returned sample nomenclature: This nomenclature has been developed in parallel with OSIRIS-REx science and curation activities to prepare for Earth return of the OSIRIS-REx samples. The nomenclature evolved following sample collection along with SRC/sample canister/TAGSAM disassembly procedures developed in detail and database planning has been undertaken. The goals for development of this return sample nomenclature include unique numerical identifiers, sufficient flexibility to cover the different samples within the collection, compatibility with relevant databases, and building on the nomenclature heritage from other NASA astromaterials collections. Based on the nature of the anticipated collection, JSC curation plans to assign new sample names in the foreseeable future (well beyond preliminary examination) as individual particles continue to be isolated from aggregate samples (samples that are themselves “collections” of numerous particles).

Description of OSIRIS-REx returned sample nomenclature: The sample names will start with the collection prefix “OREX-” followed by a six-digit sample number which in turn is followed by a second dash and a three-digit split number (Figure 1). The digits on the far left of a six-digit sample number will denote information about (1) where in the SRC asteroid material was collected (for example if it was inside the TAGSAM head upon disassembly), (2) what type of hardware the asteroid sample was associated with (such as contact pads, witness plates, etc.), and (3) for hardware items, information about where in the SRC that hardware belonged.

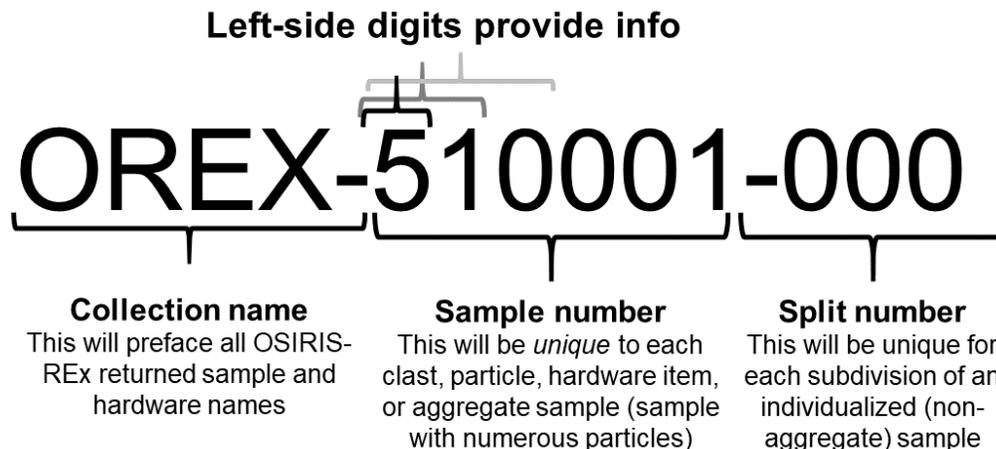


Figure 1: Basic Anatomy of an OSIRIS-REx sample name.

References: [1] Laurretta D. S. et al. (2021) *In* Sample Return Missions: The Last Frontier of Solar System Exploration:163-194 [2] Bierhaus E. B. et al. (2021) *Icarus* 355:114142 [3] Laurretta D. S. et al. (2017) *Space Science Reviews* 212:925–984 [4] Bierhaus E. B. et al. (2018) *Space Science Reviews* 214:107 [5] Dworkin J.P. et al. (2018) *Space Science Reviews* 214:19