

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, and 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 asteroid material and the flight hardware. We expect most of the asteroid material to be inside the head of the Touch-and-Go Sample Acquisition Mechanism (TAGSAM) [3-4], and that this material will include a broad range of particles sizes from as large as a few centimeters to less than a micrometer across in their longest dimension [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, or serendipitously wedged into or adhering to hardware items [3-6]. The nomenclature for this new astromaterials collection must accommodate the different types of samples it comprises.

Development and description of the returned sample nomenclature: This nomenclature is being developed in parallel with OSIRIS-REx science and curation activities to prepare for Earth return of the samples. It has evolved following sample collection, the development of detailed hardware disassembly procedures, and database planning. 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 anticipated nature of the bulk sample as a collection of loose material, JSC Curation plans to assign new sample names as individual particles are isolated from aggregate samples (samples that are themselves “collections” of numerous particles). This approach is expected to start during the early characterization and continue well into the future as more material is allocated for study.

In the proposed nomenclature, sample names will start with the collection prefix “OREX-”, followed by a six-digit unique 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 denote information about (1) where in the SRC asteroid material was collected (for example, if it was inside the TAGSAM head upon disassembly), (2) with what type of hardware the asteroid material was associated (such as contact pads or witness plates), and (3) where in the SRC each piece of hardware was located.

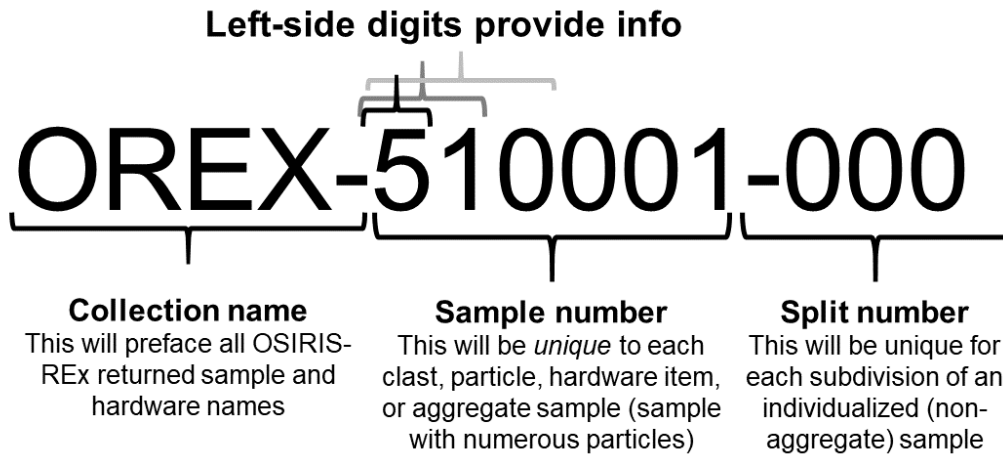


Figure 1: Basic anatomy of an OSIRIS-REx sample name in the proposed nomenclature scheme.

References: [1] Lauretta 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] Lauretta D. S. et al. (2017) *Space Science Reviews* 212: 925–984 [4] Bierhaus E. B. et al. (2018) *Space Science Reviews* 214: 107 [5] Lauretta, D.S. and the OSIRIS-REx TAG Team (2021) *Lunar and Planetary Science Conference* 2548, abstract # 2097. [6] Dworkin J.P. et al. (2018) *Space Science Reviews* 214: 19.