



UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

DIVISION OF
CORPORATION FINANCE

Mail Stop 3030

April 11, 2017

Mary G. Puma
Chief Executive Officer
Axcelis Technologies, Inc.
108 Cherry Hill Drive
Beverly, Massachusetts 01915

**Re: Axcelis Technologies, Inc.
Registration Statement on Form S-3
Filed April 7, 2017
File No. 333-217192**

Dear Ms. Puma:

This is to advise you that we have not reviewed and will not review your registration statement.

Please refer to Rules 460 and 461 regarding requests for acceleration. We remind you that the company and its management are responsible for the accuracy and adequacy of their disclosures, notwithstanding any review, comments, action or absence of action by the staff.

Please contact Tim Buchmiller at (202) 551-3635 with any questions.

Sincerely,

/s/ Tim Buchmiller for

Russell Mancuso
Branch Chief
Office of Electronics and Machinery

cc: Lynnette C. Fallon, Esq.
General Counsel, Axcelis Technologies, Inc.

Matthew C. Dallett, Esq.
Locke Lord LLP